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February, 1918



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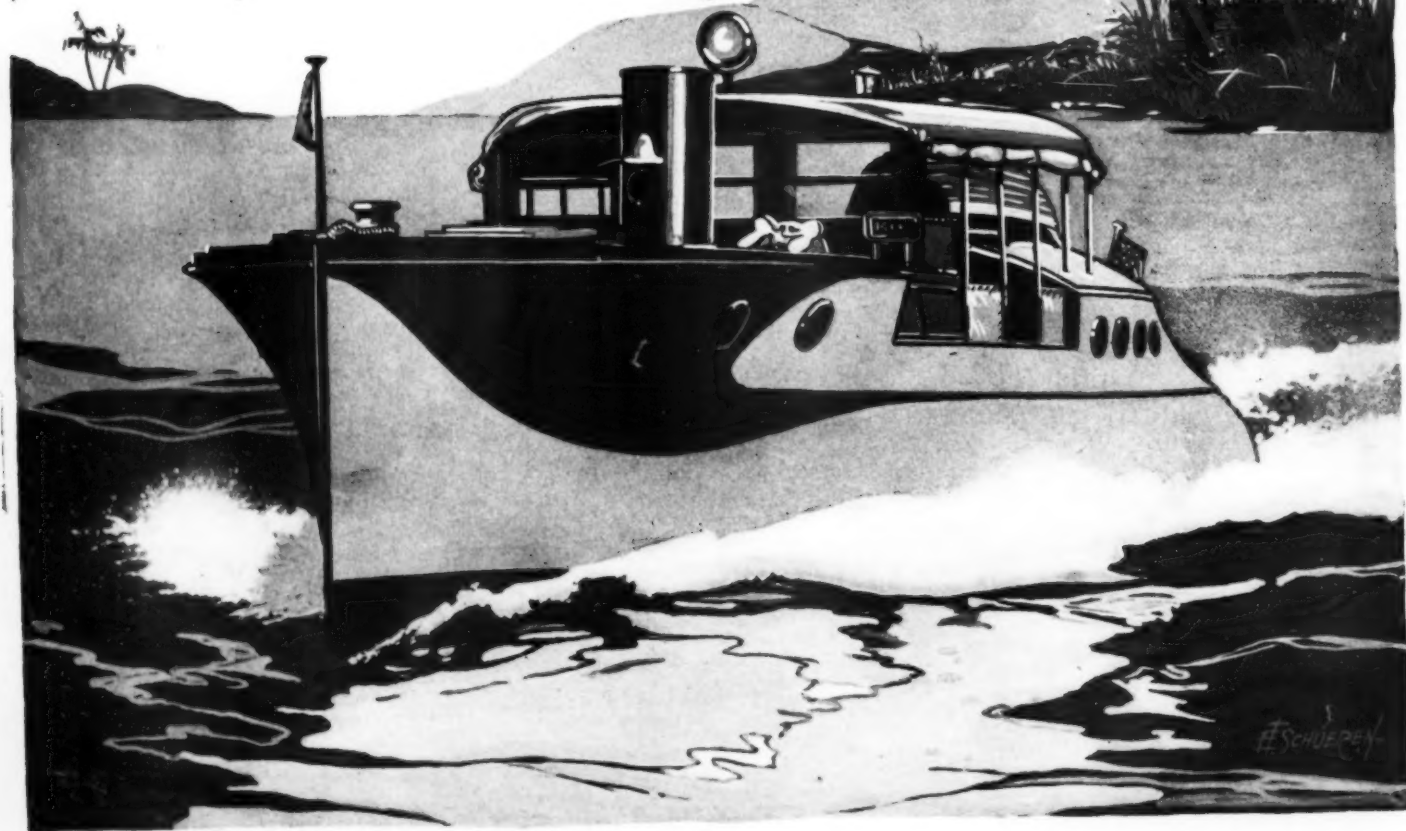
For Use in Florida This Winter

A FIFTY FOOT Military type Express Cruiser with accommodations for a party of eight and a crew of two. With a speed of 20-24 miles an hour. Completely equipt in every detail.

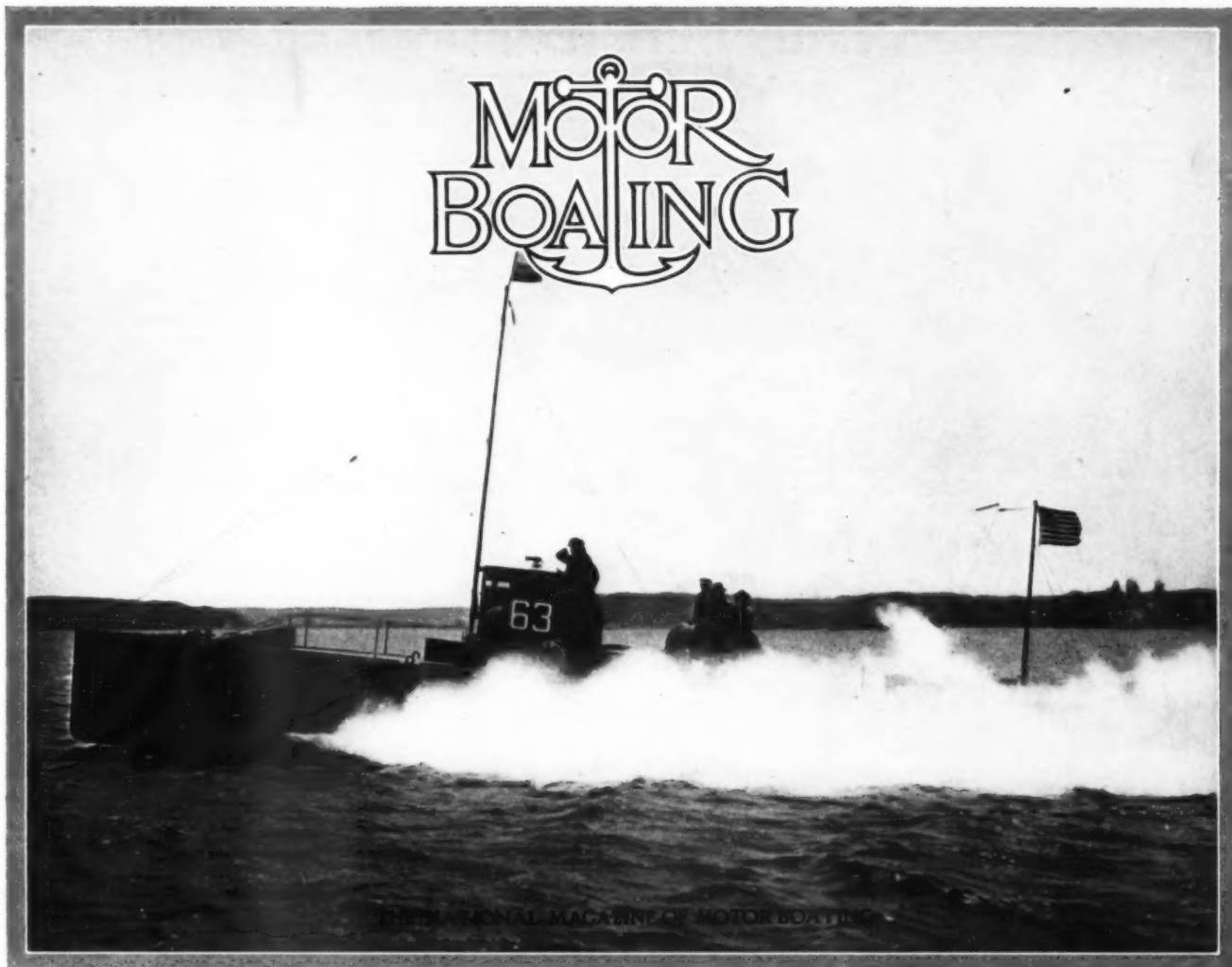
Two such boats are now ready for IMMEDIATE shipment. Promptly on receipt of your instructions, one of these boats can be loaded on cars and rushed through to whatever point you may designate. It will be accompanied every foot of the way by one of our own men, a man who will stay right with the boat until your crew thoroughly understand its operation.

Write to-day for Booklet No. 111, describing and illustrating this boat in detail.

Great Lakes Boat Building Corporation
Designers and Builders of Boats of distinction
and quality
MILWAUKEE, WIS.



MOTOR BOATING



An American-built patrol boat now doing duty in foreign waters. She is Duesenberg powered

Smoothing the Bumps

Some Sound Suggestions for the Beginner and Amateur Builder

CHAPTER I

In Four Parts

IN his effort to spread his small store of wealth into as much boat material as possible, the embryo yacht constructor is likely to overlook a number of important details, which seem innocent in themselves but have a peculiar way of piling up, and, at the grand reckoning of cost and result, assuming the proportions of a great big jolt. It is these little bumps that we are going to try to clear away from the path of the amateur builder.

The art of yacht building is no secret science, as was once supposed. There are no wonderful stunts to be performed, impossible for the average human being, in spite of assurances to the contrary by the old-time builders.

We do not mean that anyone who can drive a nail can produce a successful boat. But we will say that the art is nothing more or less than the common variety known as "horse" sense coupled with skill in handling tools—and some perseverance. We are not going to describe to you how yachts are built, as there are so many methods of arriving at approximately the same results that our talk would be confusing to one who had never tried the game before. We are going to try to tell you the simplest methods of arriving at a given result, and leave you to acquire the complicated stunts in your second boat.

First of all, decide before you begin what you want. It's much easier to work this problem out in the first stages of the game than to work the job through and discover that you know positively what you don't want, and at the same time have it in your hands. A yachtsman who has received his early education in sailing craft need not worry about following his own ideas in selecting the design for a motor boat, but he who

has had no such training will have considerably more study in store for him.

In order to produce a successful boat, the conditions under which it is to be used should be carefully studied and the craft properly designed to meet these requirements, as no single boat can be expected to be suited to all sorts of service and conditions.

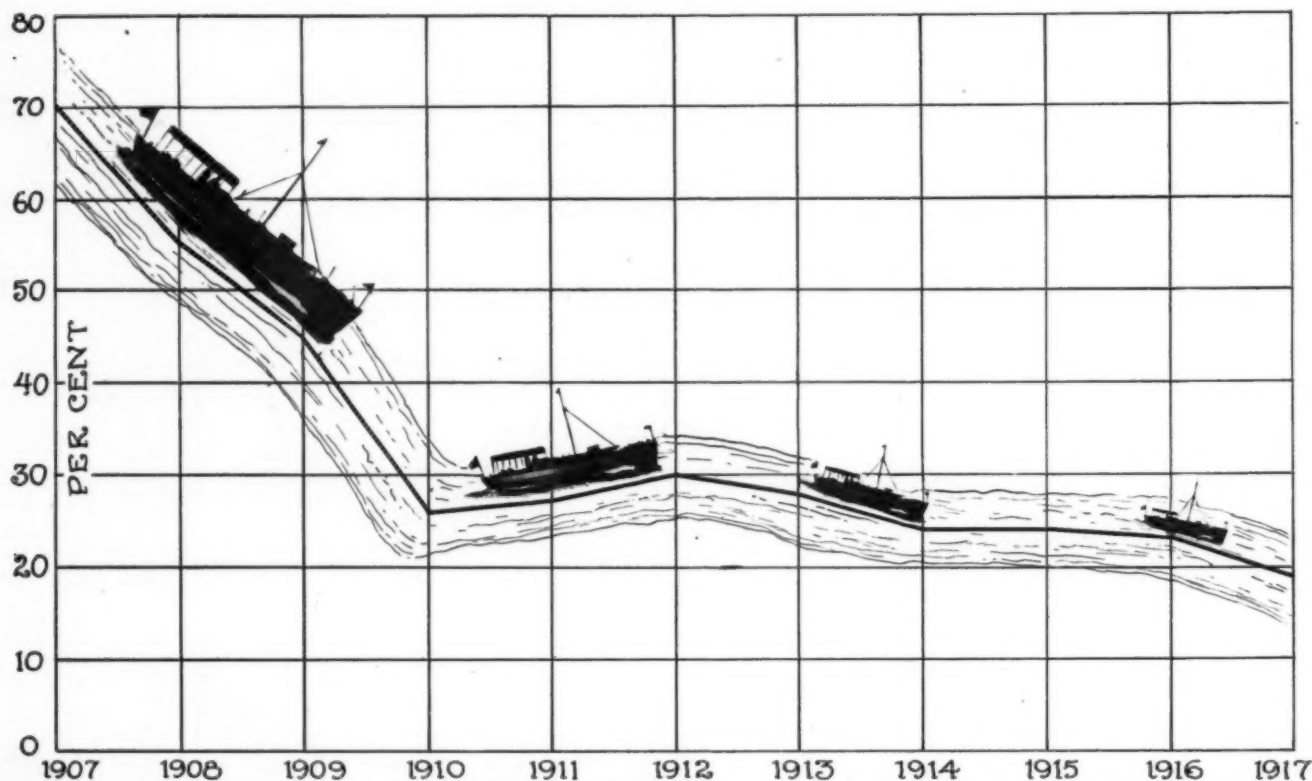
If you have friends who had experience in the motor yachting game, and you can find among them one who has been raised in sail boats, go to him for advice. Explain what you think you want and he can tell you whether it is good for you or not. Take his word for it, entirely or not at all. He may make some mistakes—they all do—but when you are beginning the game it's much better to make the same errors that an old hand at the game is liable to make than to go around to a number of experts picking up a little knowledge and advice from each one in turn. Unless you are particularly fortunate, you'll surely fall down on this system, as expert advice from a number of sources is bound to be conflicting, and lack of experience will not permit an intelligent sifting of ideas down to the survival of the fittest. The most you can expect under these conditions is a hopeless jumble. Experience is the only sifter which will work on yachting ideas, and this is bound to come if you stick to the game.

If you cannot get any free advice worth while, go to a competent architect. Explain what you want, have him get you up a design, and pay the price. It will be the best investment you can make. A properly designed boat, besides fulfilling the

(Continued on page 54)

What Ten Years' Experience Has

Changes in Type, Size, Power, and Speed Through Which the Motor Cruiser
The Modern Cruiser a Larger, More Comfortable, Faster and Better



A curve showing graphically the percentage of the total number of gasoline-driven cruisers built each year that were of the trunk-cabin type. The size of the boats pictured corresponds to the percentage

HOW many of the motor boatmen who sailed in a trunk-cabin cruiser ten years ago would trade their raised-deck craft of to-day for those of the old type? Probably there are few who have been in the game for ten years who at sometime have not tried to sleep under a leaking deck joint or had an unexpected wave come aboard via the cabin window, making a mess of things in general.

After the old top-heavy glass-cabin cruiser had proven unsatisfactory, the trunk cabin became the most popular type. It was such an improvement that seventy per cent. of the boats built in 1907 were of that design. The trunk-cabin cruiser had many advantages over the glass-cabin type. They were more seaworthy, easier to handle, did not feel the effect of the wind to such an extent, the cabin could be arranged for much greater comfort of those aboard and it provided a cockpit, the

portion of a boat used more hours per day than all the rest combined.

Although the trunk-cabin cruiser was such an improvement over the glass-cabin type, it could not compete successfully with the raised-deck craft with its increased cabin space, more freeboard at the bow and greater flare to throw the waves out instead of picking them up on the deck.

Since 1910 over half of the motor cruisers built every year have been of the raised-deck type. In 1917 they comprised 71 per cent. of all the motor cruisers built.

The number of cruisers of the flush-deck and similar types never exceeded 16 per cent. of the total number of motor cruisers built in any one year since 1907. This includes gasoline-driven cruising houseboats.

After the successful demonstration of seaworthiness, reliability and speed of Flyaway

III and several other similar boats, the express cruiser became at once a much-desired model, practically all of these being along the lines of the raised-deck type.

Another marked change in cruiser design resulted from the success of these same boats. It was demonstrated that a heavy, strongly built cruiser of the V-bottom type could be made to plane, and in this way develop more speed with the same power than the displacement type of hull. To-day nearly every one of the fastest cruisers and patrol boats are of the V-bottom type.

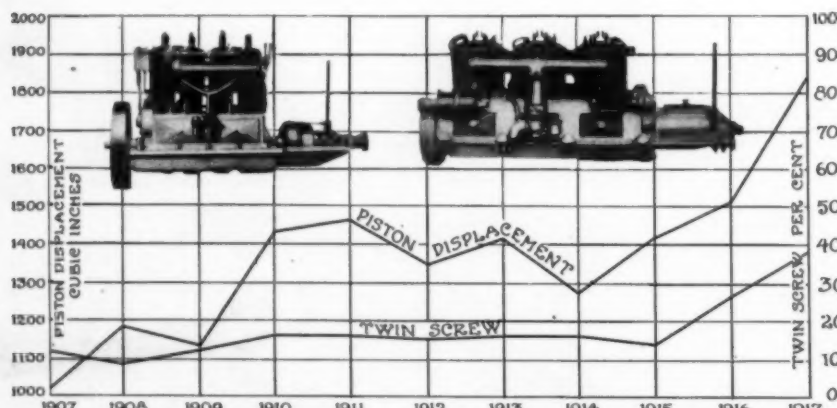
The effect of the war on motor boat design is shown by the great number of military or scout type cruisers built during the last three years. They are a direct development of the express cruiser to meet new conditions, and most of them come under the classification of raised-deck cruisers.

As shown by the curve, the length of the average motor cruiser has increased considerably since 1907 but not with uniform regularity. There was a marked increase in the average length from 1908 to 1911 which corresponds to the period during which the marine engine in large units became a reliable power plant.

There was another decided increase in the average length from 1915 to the present time. This corresponds to the perfection of the high-speed six- and eight-cylinder motors which are used to drive the fast cruisers either as single or twin-screw power plants.

The beam of the average motor cruiser has not increased at the same rate as the length. This is due to the ever-increasing boat speed, and especially to the development of the express and patrol-type cruisers.

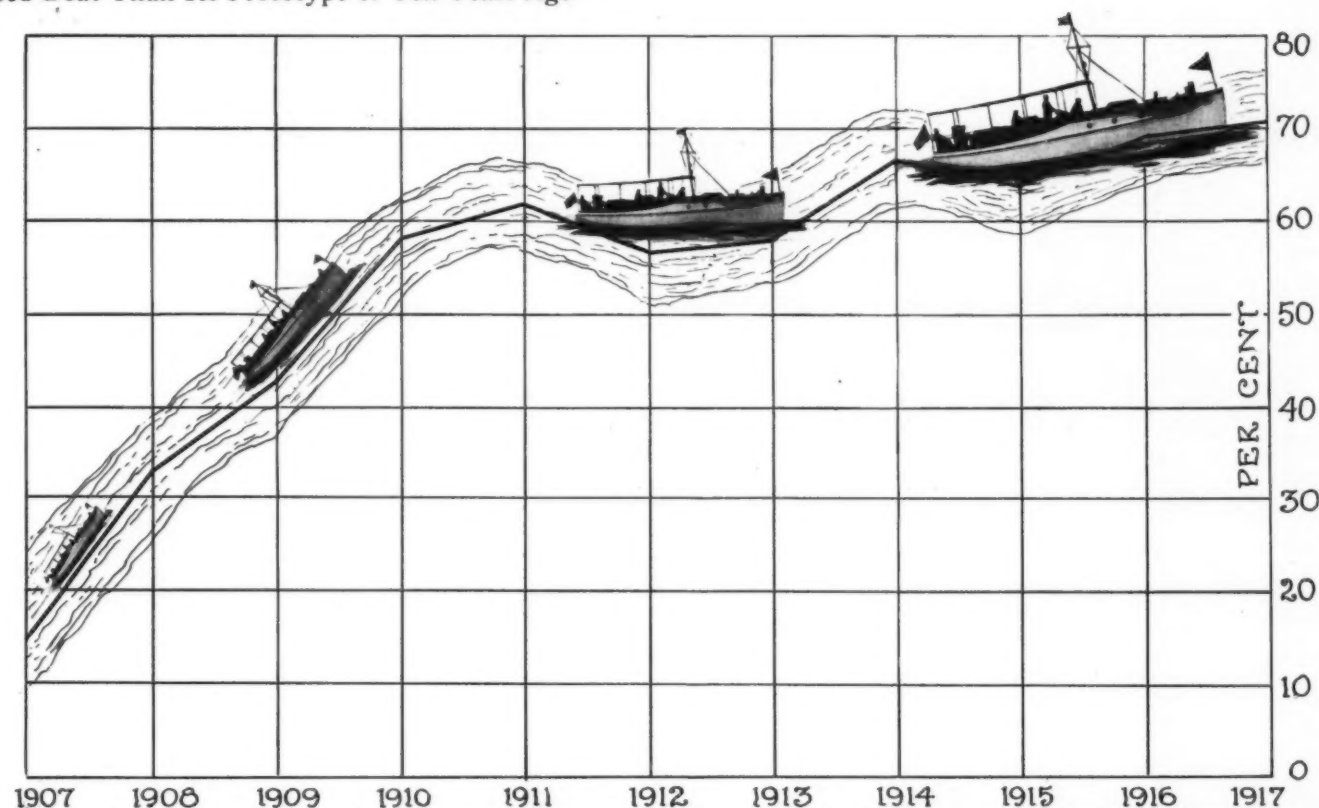
The number of two-cycle motors installed has decreased from 12 per cent. in 1907 to 2 per cent. in 1917. A great many of the early motors, both two- and four-cycle, were equipped with make-and-break ignition, but now practically all are provided with high-ten-



A year-by-year comparison of the average power plants installed in cruisers. The piston displacement curve is the total piston displacement per boat. The piston displacement per cylinder did not change during the entire period. The motors shown are typical of those of 1907 and 1917

Accomplished In Cruiser Design

Has Passed during the Last Decade and What Has Been Accomplished—
Equipped Boat Than Its Prototype of Ten Years Ago



From the above curve it will be seen that the most rapid increase in percentage of raised-deck cruisers corresponds exactly with the decrease of the trunk-cabin boat

sion magnetos. The design of carbureters has been improved principally along the line of automatic adjustment to varying engine speed, especially for the high-speed engine.

The power plant of the average cruiser has grown from the four-cylinder engine of 1907 to the six- and eight-cylinder motors of to-day. The motors of ten years ago were crude machines when compared with an up-to-date engine. The only working parts of the motor that were then enclosed were the cranks and camshafts. On some engines of that period, the gear wheels, igniter mechanism and oiler drive were exposed in a manner that would now be considered dangerous, and was dangerous.

With the modern motor the tendency of the latest designs is to enclose every moving part, even the flywheel, and have the least possible amount of exposed oil tubing, water piping and wiring about the motor. Enclosing the moving parts keeps the dirt out and the oil in, deadens the noise and assures a clean, quiet engine-room.

The electric starter and generator, high-tension magneto, high-tension non-vibrating coil, air pump and pressure oiling systems are some of the equipment practically unknown ten years ago but now regularly furnished. The reverse gear has also received a due amount of attention from the designers. It is built now in an oil-tight case as a part of the engine base, not attached as an afterthought as was general in 1907.

There is one thing about the gasoline motor that has not varied during the last decade and that is the average piston displacement per cylinder. This seems to indicate that the bore and stroke sizes have not changed to any great extent. The power delivered per cylinder has been increased by speeding up the engine, and this was made possible by increased boat speed.

Ten years ago dry batteries and Edison primary batteries, low-tension magnetos and generators were the only source of power for ignition, though the use of storage batteries became general a few years later. The early

dry batteries were not the reliable source of power that they are to-day and the make-and-break systems then in use were hard on any kind of battery.

In 1907 the only method of lighting boats was by means of kerosene lamps. Acetylene was used to some extent a few years later, but the trouble of keeping the generator in working order prevented it from being a popular lighting outfit. Compressed acetylene is used on a few boats to-day.

Practically all of the new boats are equipped with an electric lighting plant. The generator for the small boat plant is driven by the main engine, but the larger installations are separate power plants in themselves. The generator and storage battery were used only for ignition at first, but it was not long after that batteries had proven their dependability that they were used for the lighting plant.

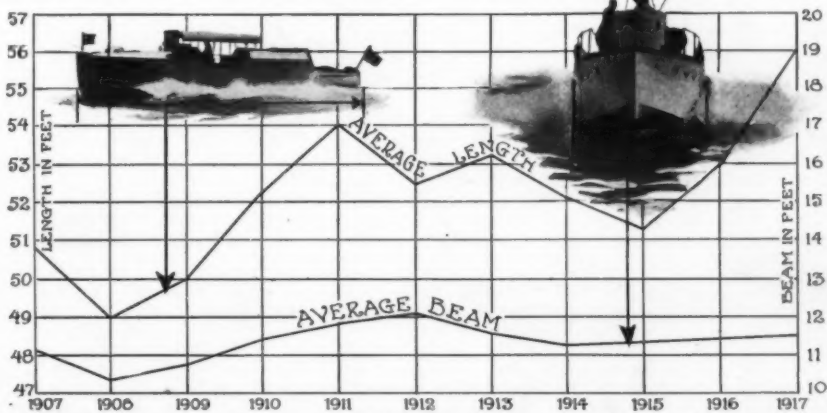
The living quarters aboard the motor cruiser have been improved from year to year until now they are fitted with every luxury found

ashore, and some are more comfortable and convenient than many a home on land.

When living aboard now, you do not use a narrow seat with a thin cushion as a bunk at night. The sleeping accommodations have springs and mattresses, and are as comfortable as any bed. Some are built like a Pullman sleeping-car berth, some as extension transoms and others are just bunks, with no attempt to use them for anything else. Ample closet space is provided for hanging clothing and liberal drawer space for clothing and bedding.

The main cabin or dining saloon in larger boats is generally fitted out so it can be converted into sleeping quarters if the owner wishes to take along more people than the other cabins can accommodate. Glass and china closets and a buffet are worked into the general layout in they do not take space, yet are of conveniently located.

(Continued on page 60)



Curves showing the average length and beam of the cruisers built each year. The change of beam-to-length ratio from 1915 to 1917 is clearly shown. A comparison of the average length and average piston displacement curves shows a remarkable similarity in development

Runabouting!

A Branch of the Sport Which Offers Greater Possibilities Each Year—Very Bright Prospects for the Season of 1918—More Extended Use of This Class of Boat One Direct Result of the War

By T. W. Rockwell



Pointer, a 40-footer with large carrying capacity and a fair turn of speed. Built by Leyare Boat Works and driven by a Sterling motor

WITH the greater number of the larger craft out on patrol duty for Uncle Sam and restricted areas in our coastwise waters what chance has the motor boat enthusiast to enjoy his usual form of recreation? He has just as many opportunities as ever—plus the additional comfort and satisfaction of having a well-built boat, a power plant as nearly perfect and reliable as mechanical skill can make it and every detail as complete as the most critical could wish for.

Motor boating on inland waters is unre-

that, but the boat and power plant will be complete in every detail.

The present-day runabout is in every

The runabout from an unusual angle. A standardized 35-foot V-bottom runabout built by the Albany Boat Corporation



A 48-foot sedan under way. This type of runabout is becoming very popular as it affords protection to the passengers. This sedan was built for Logan G. Thomson by the Great Lakes Boat Building Corp. and is powered with an eight-cylinder Duesenberg motor

stricted and to those who have not already tried it will be an entirely new sport. Now, motor boating on inland waterways does not necessarily mean cruising. There is fully as much pleasure to be derived from an up-to-date runabout, which is hard for those who have had only cruiser experience to imagine. The sensation of traveling over the water at 30 miles per hour in a small boat is an experience not soon forgotten.

A few years ago the man who purchased a small open boat or runabout was never sure just how successful it would be until he had paid for it and tried it out. Now he can go to any one of a number of companies, pick out the model that meets with his requirements as to size, carrying capacity and speed and know for a certainty that he will be the owner of a boat that will actually do what the builders claim—and often better—and not only

way the equal of the automobile and in some respects is far superior. No car can be as roomy and comfortable as the cockpit of a runabout. The power plants of the two are similar in all respects, and the same equipment is to be found in both. The controls are arranged on the boat exactly in the same manner as in the car.

When it comes to speed, the car may be faster on a track, but for general use the boat will average more miles per hour than the law allows on the highways. There is no speed limit on the water, and you can do your best to beat anyone who tries to pass you.

The modern runabouts are built in sizes from 25 to 40 feet in length with one or two cockpits and an engine compartment. The general arrangement in the smaller boats is to install the motor under hatches just forward of amidships, with the fuel tanks for-

ward and the cockpit directly aft of the engine compartment. In the larger runabout the motor is installed amidships under hatches with a small cockpit forward with a seat for two or three people and a large cockpit aft of the motor compartment.

This arrangement gives an even distribution of the weight so that the boat will always trim the way the designer intended and require the minimum amount of power for the maximum amount of speed. If a boat is down by the head it tends to push the water in front of it, and if it is down by the stern it will drag the water after it; both conditions cause a material loss of speed.

The very latest design for runabouts just brought out by a well-known boat building company has the passenger cockpit just aft of amidships with the motor under the stern deck, which is provided with hatches. In the larger

Comet, a 28-foot mahogany runabout, making 32 m.p.h. among the Thousand Islands. This fast runabout was built by Hutchinson Bros. and is powered with a 90-100 h.p. Sterling motor

model there is a small cockpit forward, a large cockpit amidships, a miniature trunk cabin over the motor and a small cockpit for the engineer just behind it. In both the large and small models the fuel tanks are forward, and the controls are brought to the bulkhead amidships as in the practice in the older type. The engine drives forward to a gear box, then aft to the propeller; following the practice almost universally used in hydroplanes. The weights are distributed in this new model so that they balance about the same point as in the older type. In this way the same hull can be used for either, and the interior arrangement is optional with the individual purchaser.

It is customary in the two cockpit runabouts to have the seat-back of the forward cockpit so arranged that when not in use it can be pulled up and forward, thus forming a hatch to close the cockpit.

The power plant in an up-to-date runabout leaves little to be desired. The motors are powerful, noiseless and reliable. All moving parts are enclosed, which not only makes the engine practically noiseless, but also keeps dirt and moisture from getting into the moving parts and assures a clean engine compartment by keeping all the oil and grease in the motor where it will do the most good.

The motors are equipped with electric starting and lighting systems, high-tension magnetos, a battery ignition system for starting, a carburetor which is self-adjusting for different engine speeds, a bilge pump, a positive oiling system requiring no further attention than to keep the reservoir supplied with oil and last but not least a reverse gear that will not fail.

As to speed, most anything up to racing speeds can be had in a runabout. It is only a question of how much power is installed. The majority of them develop from 25 to 35 miles per hour and a few reach the 40-mile mark. When a boat is not intended primarily for

racing, a speed of 25 to 30 m.p.h. will give the best satisfaction for general use.

Some runabouts are built light, with low freeboard and narrow beam for use on protected waters and develop high speed with little

"Any of the following concerns will build a runabout for you or provide you with one already built."

Albany Boat Corp., Albany, N. Y.
Belle Isle Boat & Engine Co., Detroit, Mich.
Cape Cod Power Dory Co., Wareham, Mass.
Daschel Carter Boat Co., Benton Harbor, Mich.
Deering Boat Mfg. Co., Madison, Wis.
Defoe Boat & Motor Wks., Bay City, Mich.
Elco Co., Bayonne, N. J.
Fay & Bowen Engine Co., Geneva, N. Y.
Gas Engine & Power Co., & Chas. L. Seabury & Co. Cons., Morris Heights, N. Y.
Great Lakes Boat Bldg. Corp., Milwaukee, Wis.
Wm. H. Hand, Jr., New Bedford, Mass.
Hyde Boat & Engine Co., New York City.
John L. Hacker, Detroit, Mich.
Luders Marine Construction Co., Stamford, Conn.
Mathis Yacht Bldg. Co., Camden, N. J.
Matthews Co., Port Clinton, O.
W. H. Mullins, Salem, O.
Murray & Tregurtha, South Boston, Mass.
New York Yacht, Launch & Engine Co., Morris Heights, N. Y.
Niagara Motor Boat Co., North Tonawanda, N. Y.
Frederick S. Nock, East Greenwich, R. I.
Racine Boat Co., Racine, Wis.
Red Bank Yacht Wks., Red Bank, N. J.
Richardson Boat Co., North Tonawanda, N. Y.
Stearns-McKay Co., Marblehead, Mass.
Valley Boat Co., Saginaw, Mich.

tom type of hull can be used, but for higher speeds the V-bottom hull requires less power for the same speed, is drier, a better boat in a seaway and is in general more satisfactory. The V-bottom type generally has a little more beam than a round-bottom boat of the same length and speed, thus having a little more room in the cockpit.

The usual seating arrangement provides accommodations for the operator and one passenger on built-in seats just aft of the engine compartment bulkhead with a passageway between the two seats, space for wicker chairs and a seat across the stern. Cushions are provided for the built-in seats and seat backs, making them as comfortable as possible.

Following automobile practice, glass windshields are arranged in such a way that when in use they are directly over the bulkhead, and when not needed can be dropped into pockets where they are well protected against breakage. For protection from the sun or rain a folding top with curtains similar to those used on automobiles is in almost universal use on runabouts, the only real difference being the use of all-wood bows with bronze fittings for the boat tops. The pressed-steel bows used on cars will not last more than a season or two when used on a boat in salt water.

In the latest runabouts the builders have followed the automobile practice as nearly as

A small but fast and seaworthy runabout



Hazel Nut, a fast double-cockpit runabout built by the Albany Boat Corp. and driven by an eight-cylinder Van Blerck motor

power. For use on open water or along the coast the hull is built heavier, higher and wider, and requires more power to drive it at high speed. For speeds up to 20 or 25 m.p.h. the round-bot-

possible in arranging the engine controls and the auxiliary instruments on the bulkhead or instrument board in order that a person who runs both a boat and a car will be equally at home in either. This practice avoids any chance of confusion and reduces the liability of accident from that cause to a minimum. In both the car and boat the steering wheel, throttle and spark controls are identical and the boat

(Continued on page 60)



Sea Pup II, owned by O. E. Dunlap, Jr., of Dallas, Texas. This runabout was designed and built by John L. Hacker and can be driven at a speed of 32 m.p.h. by a 90-100 h. p. Sterling engine with a party of eight aboard

The Entire Company



Derfla

A 50-Foot Bug-Eye

and

Jotu

A 36-Foot Cruiser

Captains
Belfield
Leinean
Watkin
Robinson
Riley

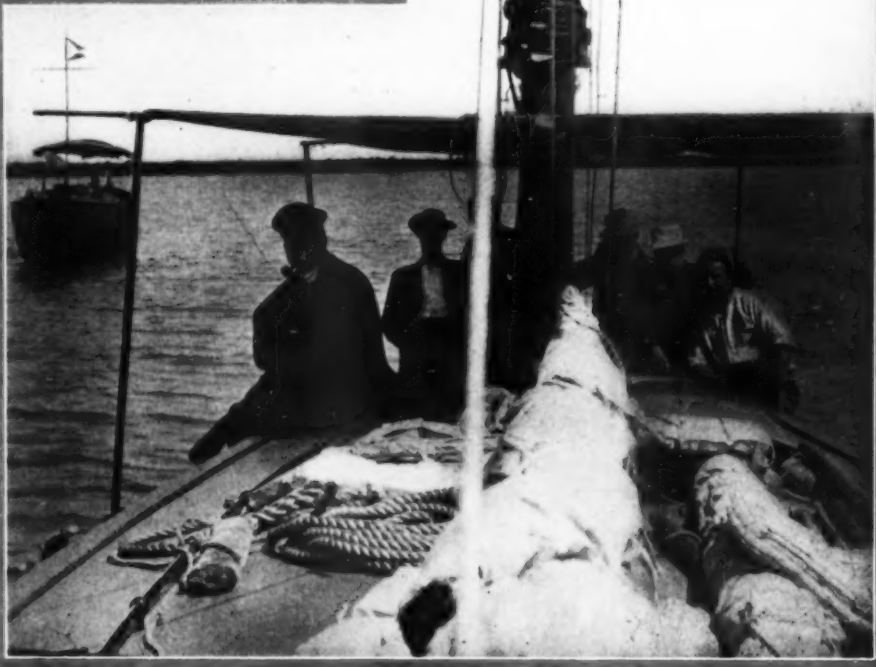
CREW
and
several
gentlemen
of leisure,
several
workers
and Harry

Captains
W. L. Jones
H. R. Jones
Folwell
Bill
Harmer

The entire company: Anchor men, ship-wrecked mariners, bathers, etc.

Time: About seven miles per(haps) hour.

Place: The Chesapeake, its tributaries, bars and beaches.



DERFLA II, which is kept at Chesapeake City, got under way on Friday evening June 11; we of the Jotu were to lock through the Delaware and Chesapeake Canal on Sunday and meet our fellow voyagers either Sunday evening or Monday, depending on circumstances.

Late Saturday afternoon the Jotu, with her entire crew, and also Mr. Riley, who was to join his brother navigators on Derfla, got under way from Riverton and proceeded down the Delaware to the Camden Motor Boat Club. Here, with many regrets, we landed Dr. Jones first, and Mr. Folwell, who were to meet us the next week at Annapolis for the balance of the cruise. We anchored for the night just inside of Petty's Island.

Although we turned in at about 10:30 P. M., none of us managed to obtain much sleep the first night aboard ship. The only reason for this being that we were all compelled to arise at four the next morning, in order to be in the canal at Delaware City before nine, the canal being closed to traffic between the hours of nine and five on Sundays. We arrived at Delaware City at quarter past eight after a dandy run of about 42 miles and were locked through immediately in company with a schooner. We then proceeded slowly on our way, having been told to limit our speed to 4 miles an hour. We paid \$4 to go through the canal—\$4 for a four-mile speed. Boats which go faster than this frequently pay very large sums for the privilege. I think the fine is a hundred dollars.

We all enjoyed the trip through the canal,

which is very pretty, with small lakes opening into it and in many places possessing high banks. Like most banks the rules governing these are also very strict—no rubbish being allowed to be deposited. We were delayed about five minutes at the second lock, but at the third and last, at Chesapeake City, we were let through immediately, being lowered a distance of about 16 feet into Back Creek. We ran down Back Creek for several miles and cast anchor in a very pretty spot where we partook of our mid-day meal, which I'm afraid we enjoyed even more than the scenery.

After straightening things up again, after the arduous labor of washing several dishes, we again got under way. It was here that the bitter feud between our anchor men and the little mud hook had its beginning. It was really the anchor's fault, for it was certainly shown every courtesy; our men were very polite at this first encounter; they even handled it with kid gloves. Not being very well acquainted with friend anchor, each man politely begged to have the pleasure of pulling it up; finally, by a kind of super-politeness, Mr. Harmer obtained the privilege, but after one pull he decided to share it, and Dr. Bill went to his assistance, whereon a terrific struggle ensued. I forget who won this bout, but the sides were so evenly matched that we decided to keep them as long as our sturdy anchor men and their gloves remained with us. I remember one instance when, after the anchor had stubbornly resisted the most vigorous efforts to dislodge it, the man at the wheel called out "Wait! I'll break it," and throwing in the

clutch he announced that it was broken. Our anchor men thereupon pulled it up with such ease that they were sure the dear little anchor must be quite destroyed, but upon carefully examining it declared that luckily it wasn't broken at all, but after this we'd have to be more careful. This merely shows the true sportsmanlike respect they bore for their mighty opponent.

We were to meet the Derfla at Randalia, a little colony of bungalows at the head of the Elk, but were really not expected until late in the evening, as they hardly thought it possible that we would start as early as four in the morning. The crew of the Derfla would probably have mutinied if compelled to start so early, but they found later in the trip how dearly we aboard the Jotu loved the cool fresh breezes of the morning with the dew upon the decks and the call of the birds from shore; why we experienced no difficulty at all in arising and taking a swim before breakfast when awakened by the Derfla as early as seven or eight o'clock.

We found the good ship Derfla anchored at the appointed spot, and visited our friends who, after hearing that we had been on the go for about twelve hours and seeing that we were comfortably anchored, immediately suggested that we pick another anchorage for the night and, after consulting their chart, decided that Rogues Harbor was about the proper place for us; so we again got started, and after a short run made a stop in a beautiful little cove running off from the Elk just above the head of the Bay. We enjoyed a

good supper, talked a while and then turned in, tired, but delighted at having reached the Chesapeake so soon.

Monday

We were awakened in the morning by a call of "Ahoy Jotu." I sleepily asked Dr. Bill the time, and he succeeded in getting me up at six by telling me it was nearly seven-thirty. We then enjoyed a fine swim with the Derfla's crew, who showed a decided lack of sympathy when I complained of the early hour.

After breakfast was over and everything had been made ship-shape, we proceeded down the Elk out into the Bay and headed for Annapolis, where we arrived in the early afternoon after a beautiful run on the clean blue waters of the Chesapeake. We anchored in the harbor for several hours and then proceeded about five miles up the Severn River, anchoring in a very attractive spot. After a swim we had supper, went exploring in the tender and turned in early, for we were very tired.

Tuesday

The next morning, after a good swim and breakfast, we ran down the Severn and landed Mr. Belfield and Mr. Robinson, who returned to Philadelphia, joining us again later in the trip. We proceeded about ten miles down the bay and then up the beautiful South River for quite a distance, went swimming and exploring and had supper. After this we had a victrola concert, retiring early, however, for our beauty sleep: soon deep rumblings reverberated through the air—a good sign that we all slept soundly.

Wednesday

Wednesday we returned to Annapolis, purchased more supplies, ran around the harbor in the tender and landed Bill and Harmer, who thoughtfully left their kid gloves as souvenirs. In the afternoon we took aboard our captain, Dr. Jones, first, and Mr. Folwell, while Mr. Robinson and some limes rejoined the Derfla's crew. We then ran up the Severn and anchored in another beautiful spot. As it looked quite cloudy and our an-

chorage was not very well protected, we decided to run across the river into a small cove which the Derfla's able crew had located upon the chart and which they assured us was absolutely safe. We ran ahead to feel out the channel, but eventually grounded in about two feet of water. Naturally, thinking that this would be close enough to land, we waved to the Derfla to keep away, but their engineer, wishing to have another shipwreck to his credit, kept the engine at full speed ahead while the skilled crew by aid of chart and binnacle succeeded in accomplishing the hitherto unheard-of feat of anchoring a 50-footer for the night in about a foot of water. To make sure that they were far enough ashore they threw us a rope, and after we broke this, without moving them an inch, it was decided that they would remain there for the time being. As the weather still looked doubtful, we ran back across the river, anchored for the night and retired. The Derfla's crew arose early, and at high tide managed to push off.

Thursday

After breakfast we rank back to Annapolis, where a surgeon machinist came aboard and

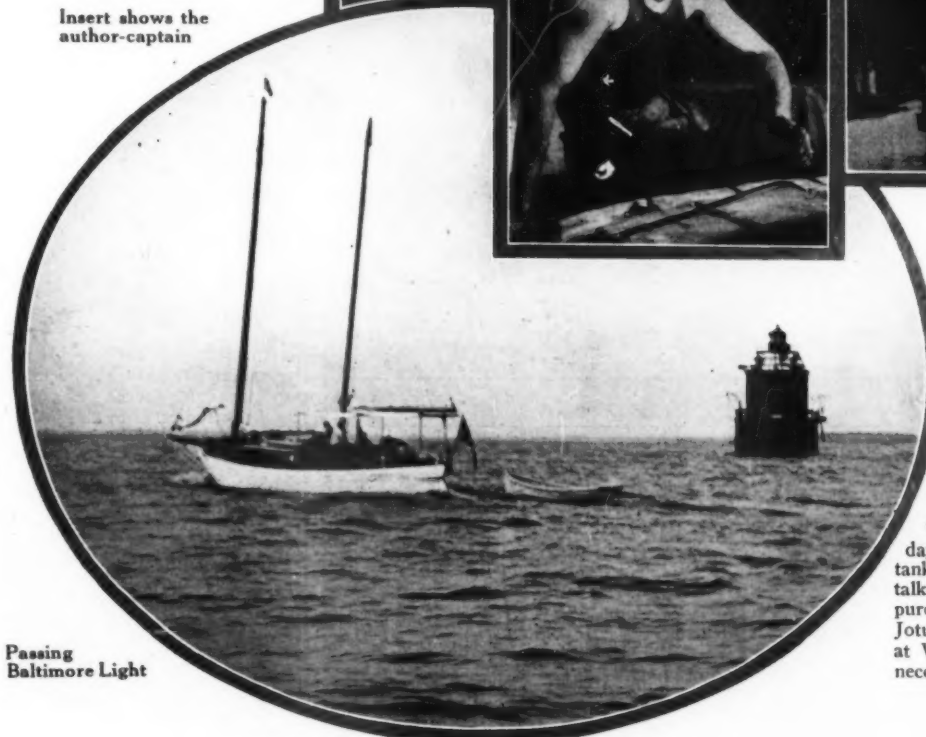
fixed the clutch; he announced that the dog's condition was not serious. We then enjoyed a beautiful run down the Bay up the West River into the Rhoda River which, with its many little islands, one could explore for a week or so without tiring. After enjoying a fine swim, a good supper and a pleasant evening, we once more visited slumberland in preparation for another glorious day.

Friday

On Friday we ran up the Bay to the Magaethy River, which we entered and ran up as far as Dividing Creek, where Captain Belfield was to join the party. Knowing that Mr. Belfield would wish to have something to occupy himself with on his return from the city after a long walk from the station and a hot ride in the tender, the Derfla's considerate crew managed to put the boat aground, jam the clutch and break the binnacle, while I delicately tied up the coil to make it buzz, which it wasn't supposed to do. This ingenious repair is said to have been pronounced as "Some more d— nonsense" by the good-natured skipper. After things had been put in shape, Mr. Belfield happened to notice that a storm



Insert shows the author-captain



Passing Baltimore Light

The locks at Chesapeake City

was approaching and that we were preparing supper, so he insisted on a run to Bond's Pond. As it was blowing quite hard we decided to run ahead and get settled as soon as possible; so we ran up the Magaethy to Silery Bay and, by careful soundings, just discovered shoal water in time to back out as the Derfla made her appearance. We then followed her to the anchorage which, to me, is the most wonderful one of all.

Saturday

The next morning, which was Saturday, we had our swim, filled our water tanks from a dandy spring and sat around talking. The Derfla's commissary department purchased some fine crabs and invited the Jotu's crew to dinner, which was to be served at Worton's Creek that evening; it is hardly necessary to say that we accepted. We started

(Continued on page 60)

Practical Navigation for the Motor Boatman



Description of Sextant and Octant
Testing Second-Hand Sextants
Making Adjustments
Reading Verniers

By W. Mack Angas

IN SEVEN PARTS—PART IV

Location by Three Point Method
Three Arm Protractor
Danger Angle
Index Error

THE first three articles of this series took up the compass, the working of dead reckoning, and the finding of the course and distance between two positions on the earth's surface. These three subjects comprise the first of the two great divisions of navigation and will not be dealt with further except to show their relation to the second great division, nautical astronomy, which is to be taken up.

Just as a thorough understanding of the compass is necessary for an intelligent application of dead reckoning to navigation, so is a mastery of the sextant necessary for a real grasp of practical nautical astronomy. This article will then deal with the sextant, its use, care, and adjustment. The subject of astronomy pure and simple will not be touched upon until next month, the practical applications of the sextant discussed this month being aids to difficult piloting rather than navigation in the sense of offshore position finding. Let it be said here that there is no difference in principle between the sextant and the quadrant and what is to follow applies to both instruments though only the sextant be mentioned by name.

The sextant is an instrument for measuring angles and is used by mariners because it gives results of the required degree of accuracy without requiring a fixed base or support. The transit and similar instruments are in many ways superior to the sextant for use ashore where a firm support can be provided for them, but the unsteadiness of even the largest vessels in the calmest seas prohibits the use of any but hand instruments on ship board. The sextant should not, however, be looked upon as purely a navigator's instrument. The civil engineer and explorer find it just as useful as the navigator does when hand instruments are necessary because of their portability and convenience. Figure 1 is a diagrammatic sketch of the essential parts of the sextant and the accompanying photograph shows a common type of instrument as it is actually built. The essential parts of the instrument are:

The frame "F" which is usually a bronze casting in the form of the sector of a circle into the periphery of which the graduated silver arc "A" is inlaid; the horizon glass "H" which is a small bit of optically plane glass shown edge view in the diagram, the half of the glass nearer the reader being clear and the half nearer the frame being silvered to make it a mirror; the arm "L" which rotates on the pivot "O" located at the mathematical center of the arc and which is fitted with a mirror called the index glass "I" and a device called a vernier "V" by means of which small divisions of angle may be read from the coarsely divided arc; the sight tube "T" which defines the position of the observer's eye; two sets of shade glasses "S" and "S" which protect the eye of the observer from the bright light of the unshaded sun when it is being observed; and the clamp and tangent

screw "C" by means of which the arm may be accurately set in some desired position. The "plane of the instrument" is the plane defined by the arc; the mirrors must be perpendicular to this plane. The arcs of sextants are divided or "cut" in a variety of ways in different makes of instruments; those on the finest ones being divided by graduations ten minutes apart, the verniers on such instruments enabling angles to be measured to ten seconds; while the cheaper instruments have arcs cut to half or thirds of degrees with verniers reading to half minutes. The clamp and tangent screw are shown diagrammatically as in practice they are more compactly arranged. The clamp grasps the beading on the edge of the frame when the screw "C" is tightened; when the screw is loose the jaws of the clamp slide along the beading and the arm may be set in any desired position by tightening the clamp; after the clamp is tightened the arm may be precisely set by turning the tangent screw. The sight tube is often removed and replaced by a telescope when very accurate results are desired.

To use the sextant the observer takes it in his right hand by the handle and looks through the sight tube and the clear part of the horizon glass at the lower of the two objects between which he wishes to measure the angle, or at the left hand object if the instrument is being held face up to measure a horizontal angle. The clamp is then loosened and the limb pushed slowly forward until the other of the two objects appears in the silvered part of the horizon glass and coincides with the first object as seen through the clear part of the glass. When an approximate coincidence of the objects is obtained the clamp is tightened and a precise setting of the arm made with the tangent screw, the arc and vernier are then read to get the angle between the objects. The path of the light rays from two objects is shown in Figure 1, but for a discussion of the optical principles of the instrument, the reader is referred to Bowditch, page 92. Photographs show

the sextant in use measuring a vertical angle between the sun and horizon and a horizontal angle between two aids to navigation. In measuring a vertical angle between the sun and horizon the lower edge or "limb" of the sun's disc is brought into contact with the horizon unless unusual circumstances make the upper limb preferable. When a horizontal angle between aids to navigation is measured the best possible coincidences of the images as indicated by the judgment of the observer is used. Figure 2 shows bit of shore line with a lighthouse and buoy in sight and below is shown how these objects would look in the horizon glass of the sextant when a good coincidence had been obtained.

The reading of the arc and vernier generally offer some little difficulty to the beginner. The general principle of the vernier will be explained here and the reader should be able to un-

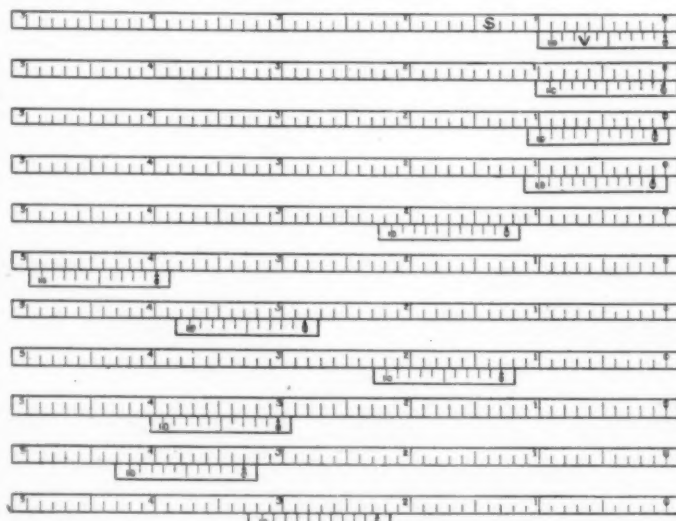


Fig. 3.—Decimal Verniers. The top vernier reads zero and the readings of the others in order are: 0.01, 0.09, 0.10, 1.25, 3.99, 2.83, 1.29, 3.04, 3.30 and 2.26



An old fashioned instrument—a quadrant with wooden frame and ivory arc

it and whose position is to be read to the nearest hundredth is marked with an arrow head and an "O" because it is the zero of the vernier scale "V" which is a short scale nine-tenths of a unit long, but which is nevertheless divided into ten equal parts. In the position shown the first graduation on the vernier (not counting the zero point as the first graduation) is one-hundredth of a unit from the one-tenth graduation of the scale, the second graduation on the vernier is two-hundredths of a unit from the two-tenths graduation of the scale and so on until the ninth graduation of the vernier is nine-hundredths of a unit from the nine-tenths graduation of the scale with which the tenth graduation of the vernier is exactly coinciding. If the index mark were to be moved one-hundredth of a unit to the left the first graduation of the vernier would coincide with the

Testing the Perpendicularity of the Index Mirror. The arc and its image, reflected in the index mirror are, viewed from beyond the apex of the frame, while the arm is clamped at thirty, or forty degrees. The reflected image of the arc should be a continuation of the arc as seen directly. If the reflected image tips up or down the index mirror is not perpendicular to the plane of the instrument and must be made so by turning the screws at the back of the mirror

derstand how the instrument works and is used, but it must be admitted that *nothing* but practice will enable one to learn to read a vernier rapidly and accurately. The simplest of all verniers is the instrument that enables hundredths of some unit to be read from a scale divided to tenths but with these ten divisions just as accurately marked as hundredths would have been had the scale been more finely divided. In the top vernier of Figure 3 the scale is lettered "S" and the index mark which slides along

index mark which shows the units and tenths of the reading, the additional hundredths are obtained by counting the number of graduations from the zero point of the vernier to the graduation which exactly coincides with a graduation on the scale. Figure 3 shows a number of decimal verniers at different settings with the reading of each vernier given. The student should read all these verniers and check the readings as given. The decimal vernier is used on modern mercury barometers.

The vernier on a sextant is not a decimal vernier but it works on the same principle. Before attempting to read a sextant vernier it is first of all necessary to note how finely the arc is divided and decide how many minutes are represented by each graduation on the arc, then note how many graduations there are on the vernier and consequently how many seconds are represented by the finest of these graduations. If each degree on the arc is divided into six parts each division equals ten minutes and on such an instrument the vernier will be divided into sixty parts, each fine division representing ten seconds of angle; on the cheaper instruments where the arc is graduated to twenty minutes or thirds of degrees the vernier will usually be divided into forty parts and the fine divisions will then be equal to half a minute or thirty seconds. Having decided upon the value of the graduations on both arc and vernier the actual reading of the instrument is simple as it is read in the same way that the decimal vernier was read. First the degrees and minutes corresponding to the graduation of the arc lying immediately to the right of the index or zero point of the vernier are noted. Then the vernier is examined and the minutes and seconds corre-

How the Sextant is held to measure a horizontal angle

Measuring a Vertical Angle with the Sextant. The clamp has been locked and a final precise adjustment is being made with the tangent screw

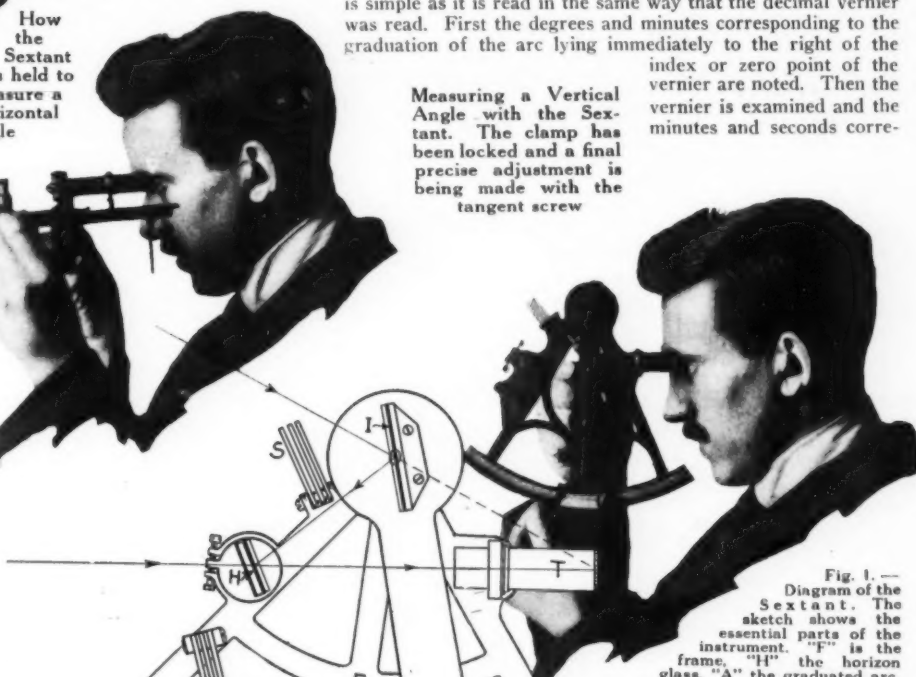
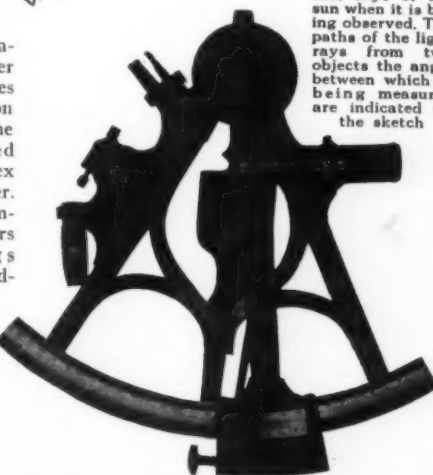
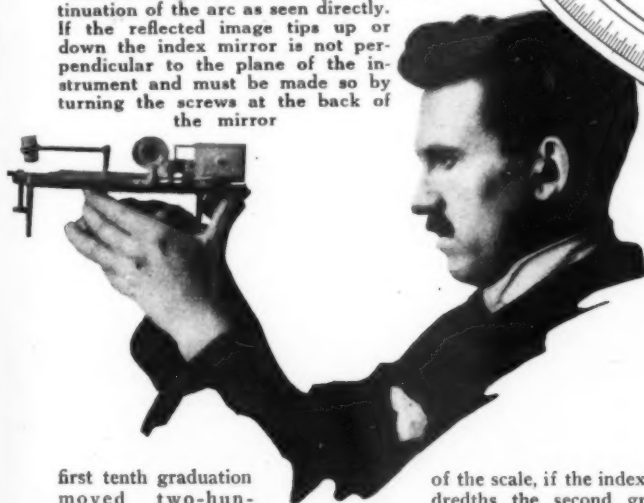


Fig. 1.—Diagram of the Sextant. The sketch shows the essential parts of the instrument. "F" is the frame, "H" the horizon glass, "A" the graduated arc, "L" the arm which swings about the pivot "O"; the index mirror "I" and the vernier "V" are attached to the arm and moved with it while the clamp "C" locks the arm in any desired position and the tangent screw enables it to be moved a small distance with great precision after the clamp is locked. The sight tube is "T", the tube being often replaced by a telescope much like the sight tube in external appearance. "S" and "S" are shade glasses to protect the eye of the observer from the direct rays of the sun when it is being observed. The paths of the light rays from two objects the angle between which is being measured are indicated on the sketch



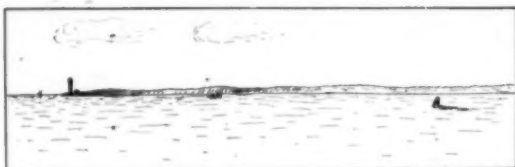
A Modern Sextant. The various parts may be identified by their names as given on the diagram. It will be noted that a magnifying glass is provided to make the reading of the vernier less trying to the eyes and the vernier is shaded with a bit of ground glass for the same reason

first tenth graduation moved two-hundredths of the vernier of the scale, if the index were moved two-hundredths the second graduation would coincide with the second hundredth graduation of the scale and so on until if the index were moved nine-hundredths of a unit the ninth graduation of the vernier would coincide with a graduation on the scale, and finally if the index were moved ten-hundredths or a tenth the last graduation of the vernier would coincide with a graduation on the scale but at the same time the index mark itself would coincide and the vernier would really not have to be read at all. Because all the graduations on the scale are the same distance apart this principle can be applied to reading hundredths at any part of the scale and is not applicable merely to the part lying between the zero and the first tenth graduation. To read a decimal vernier of this kind it is necessary to first note the position of the

sponding to the graduation of the vernier which exactly coincides with any graduation on the arc are added to the previously obtained reading of the index mark of the vernier. Figure 4 shows a number of sextant verniers at different settings with their proper readings, and as before the student should carefully check these readings. Beginners often are so engrossed with the reading of the fine divisions of the vernier that they make mistakes over the simple matter of reading the position of the index mark. The

student should carefully guard against this inconsistency, for degrees and large fractions of degrees are of vastly greater importance than minutes or seconds, important though the latter may be in accurate navigation.

Most amateur navigators do not possess sextants. Because of the great cost of new instruments it is in general best for a beginner to get hold of an old one and fix it up for himself, or have an instrument maker do this, especially as good instruments are scarce and in great demand by professional navigators. Two good types of old-fashioned instruments are illustrated by photographs, the first being the writer's sextant and the other a fine example of the wooden frame quadrant known to mariners of the old school as the "hog yoke." In getting a second-hand instrument there are certain features that the instrument must possess if it is to be of any practical use. First of all the frame must be uninjured and the plane of the arc a true plane, for if the plane of the instrument is not true the sextant is useless. Secondly the arc must be legibly marked for its entire length. If the arc is of ivory and has become loose and moved endwise in the groove in the frame into which it fits it may easily be fastened by putting a drop of LePage's glue into the groove and sliding the arc back to its original position, but all the graduations must be legible. The third important feature of an old sextant is the condition of the arm with its pivot, clamp and tangent screw, vernier and index glass. The arm must be uninjured and must swing along the arc without binding at any point and without having any play or rattle at the pivot; the clamp and tangent screw must operate without lost motion or sticking, or at least be capable of being put into such condition; the vernier must be in good condition with all graduations legible; and the frame of the index glass must be in good shape. The index mirror may be easily replaced if broken. It is also important that the frame of the horizon glass with its adjustable base be in good condition. A point to make sure of in buying any sextant, whether new or old, is the accuracy of the graduations on the arc. These may be tested by setting the index mark of the vernier so that it exactly coincides with some graduation near the beginning of the arc and noting whether the last line of the vernier also coincides with a line on the arc. This test should be carefully repeated until every part of the arc has been covered. Whenever the zero point of the vernier coincides with a graduation on the arc the last line of the vernier should also give a coincidence. Applying this test to the entire arc of an instrument is tedious, but



Horizontal angles bit of shore line to the eye and appear in the sextant when a buoy and the obtained. When the object is angle between them may be read from the graduated arc and vernier on the sextant



with a sextant. As it would appear below as it would horizon glass of the coincidence of the lighthouse had been the coincidence of satisfactory

polish will irretrievably ruin it. If the arc needs cleaning it should be firmly wiped with some absorbent cotton soaked with ammonia. If the graduations are not legible after such a cleaning they may be made more distinct by rubbing with a second bit of cotton onto which a very little lamp black has been dusted. The object of this treatment is to work the black material into the graduations without leaving any on the surface of the arc. If the mirrors are broken they must be replaced by an instrument maker. Window glass or the common plate glass of commerce not being truly flat is unsuitable for this work. If the mirrors merely need resilvering the glasses should first of all be removed and cleaned with care. They can be easily scratched and ruined. Bits of the silvering which adhere persistently to the glass should be removed by dissolving in aqua regia, a process that any obliging druggist or chemist will carry out. The resilvering of the mirrors may be done with mercury and tin foil in the manner described on page 96 of Bowditch or a silver surface may be deposited on the glass by the method described in the Scientific American Book of Formulae and other reliable books of this nature. In either method success depends on the cleanliness of the glass and materials used. In the Bowditch method it is important to get some heavy tin foil from a florist for doing the work, the kind that is used for wrapping confections being so thin that the mercury dissolves holes in it as soon as it touches it. The writer has departed from the Bowditch directions in that shellac instead of the homemade varnish described was used in protecting the mirror's back, spar varnish was used over the shellac. The telescopes need no special comment as the motor boatman has surely cleaned field glasses and the telescopes of a sextant require similar treatment. Care

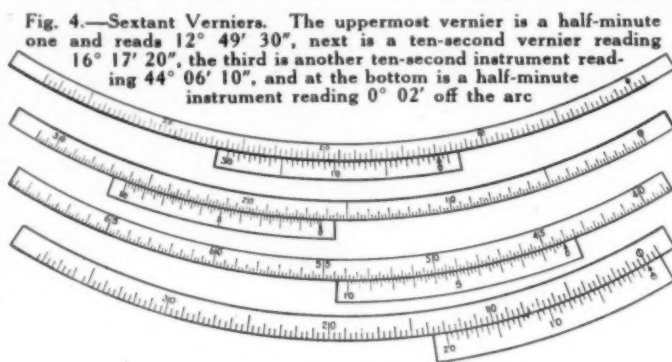


Fig. 4.—Sextant Verniers. The uppermost vernier is a half-minute one and reads 12° 49' 30\", next is a ten-second vernier reading 16° 17' 20\", the third is another ten-second instrument reading 44° 06' 10\", and at the bottom is a half-minute instrument reading 0° 02' off the arc

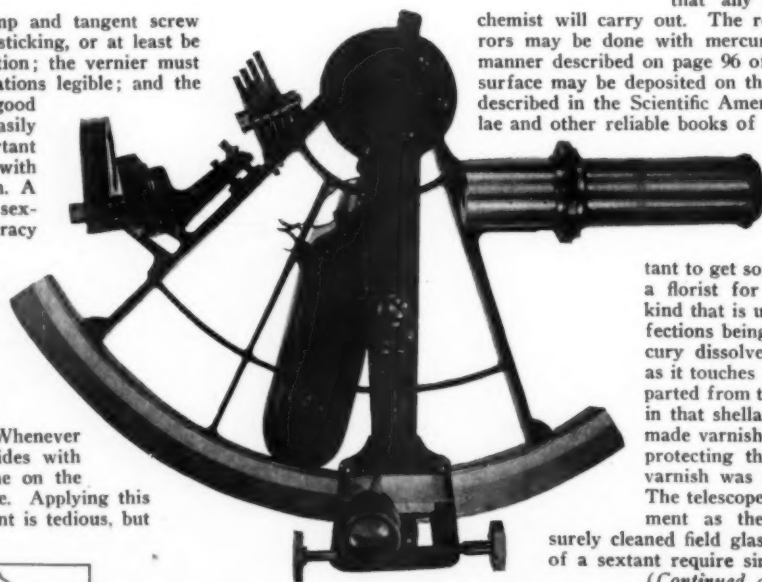
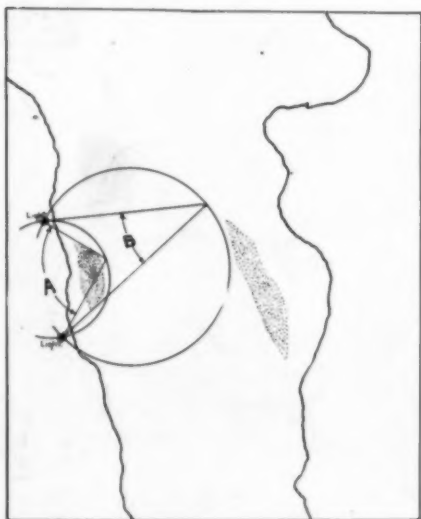
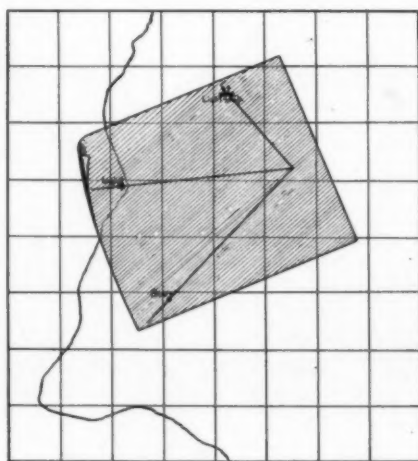


Fig. 6.—Horizontal Danger Angles. As long as the observed angle between the two lights is less than "A" the vessel must be outside of the smaller circle and therefore clear of the shoal near the lights. As long as the observed angle between the lights is greater than "B" the vessel must be inside of the larger circle and therefore clear of the other shoal. The angle between lines drawn from a point on the circumference of a circle to two other points on the circumference is equal to half the arc

Fig. 5.—Location of a Vessel by Two Horizontal Angles. This is in reality a graphical solution of the "three point problem" of the surveyor. The two angles are measured with a sextant and plotted on the tracing paper which is then so arranged on the chart that each line passes through a charted position of the object to which it represents the line of sight. When this condition is fulfilled the ship's position is pricked through from the intersection of three lines to the chart



(Continued on page 56)

Hazelton, a Patrol Cruiser

A Craft Recently Completed on the Great Lakes Which Is Now Doing Naval Duty Somewhere on the Atlantic

Hazelton at 20 miles



A TYPICAL example of the adaption of a pleasure cruiser to patrol service is found in Hazelton, George B. Markle's 40-foot express cruiser. While designed primarily for pleasure use Mr. Markle has found it possible with some modifications to make his craft a most effective patrol cruiser.

Hazelton was designed and built by the Great Lakes Boat Building Corp., of Milwaukee, Wis., and is driven at a speed of 20 miles per hour by a six-cylinder, 6 x 6-inch Van Blerck motor.

In view of the fact that Hazelton will be used by Mr. Markle for pleasure purposes after the war, the cabins are finished in white enamel and mahogany trim. The upholstery is of attractive material protected by slip covers for the time being. The boat is electrically lighted throughout and fully equipped in every particular.

Experience has demonstrated that the smaller boats of the "mosquito fleet" can be most effectively used for inside patrol and harbor duty, leaving the offshore work for the larger craft. The field of activity has a distinct bearing on the ordnance requirements inasmuch as it has been found advisable to use only machine guns on boats to be used for

inside work rather than the one-pounders and larger guns which are required for use in off-shore patrol duty.

In Hazelton the forward deck and the after cockpit floor have been reinforced to carry machine guns. Ammunition lockers have also been provided, all of which can be removed after the war without injury or damage to the boat.

The general arrangement is a large cabin forward under the raised deck which affords sleeping accommodations for a crew of six, following which is a bridge deck over the power plant and fully protected by a permanent windshield forward, an awning and side curtains. In the cabin aft of the bridge is the galley on one side and a large clothes locker and lavatory on the other, both opening on the passage-way leading from the bridge deck to the main cabin. The main cabin is fitted with extension transom berths on both sides and is entered from either the bridge deck or the after cockpit.

The power plant and all of its accessories are located under the bridge deck, where ample room is provided to have all parts of the motor accessible and give the engineers a chance to take proper care of it and in that way assure

its continuous operation and avoid having the boat laid up for engine repairs.

Although Hazelton is only a 40-footer—the minimum length fixed on by the Government for patrol boats—it shows what can be accomplished with a military type boat of standard design, built for private use, in adapting the craft to a more useful and patriotic service—a service where it will have to take the weather and sea conditions as they are, not waiting for pleasant days and calm waters before venturing out in the open. There are a number of cruisers of standard design, somewhat larger than Hazelton, that were built by the same company and are now doing patrol duty along our coasts.

Nowadays the man who wants a boat, whether runabout or cruiser, fast or slow, can secure one that will meet with practically all his requirements. At the same time he can be sure that he has a well-designed, strongly constructed craft, one that is really seaworthy and has all the available space put to some useful purpose. This has been accomplished by standardizing the design and construction, which at the same time reduces the cost of production, a lesson learned from the automobile industry to the great advantage of the boat builder.



Crew's quarters in forward cabin, showing comfortable berths for six men and the lockers at the forward end. The lockers under the transom berths provide storage space for extra clothing



Main cabin looking forward through the passage-way to companionway leading up to bridge deck. The galley is on one side and clothes closet and lavatory on the other side of the passage

Anel—A Fast Bridge-Deck Cruiser

A 55-Foot Day Cruiser with Speed and Real Comfort for Those Aboard. A Design Somewhat Different from the Usual

ANEL, one of the most comfortable cruisers launched during the last season, was designed and built by the Gas Engine & Power Co., and Chas. L. Seabury & Co., Cons., of Morris Heights, N. Y. She is 55 feet long, with a beam of 8 feet 9 inches and a draft of 3 feet and is powered with an eight-cylinder Model M Speedway motor which develops 200 h.p. The construction is oak frame, cedar planking and all joiner work of selected mahogany.

In the trials over a one-mile course Anel developed a speed of 24 m.p.h.

Photographs by M. Rosenfeld

boat is built for comfort as well as speed is clearly indicated by the windshield at the bridge and the large awning extending aft over the cockpit and which is provided throughout with side curtains for stormy weather.

Anel, and her sister ship Pronto, have proven all that could be desired in the way of fast, comfortable day cruisers, craft that any

motor boatman would be proud to own.

These boats are of the round-bottom displacement type, and even when running at full speed make very little fuss in going through the water as can be seen from the illustration. They have a good flare forward, assuring a dry boat, sharp entrance, an easy run aft and a slight tumble-home at the stern. The motors are carefully balanced and mounted on substantial beds, so that there is practically no vibration even at the maximum speed.



Anel under way makes very little fuss in going through the water. This illustration shows the well-protected deck accommodations

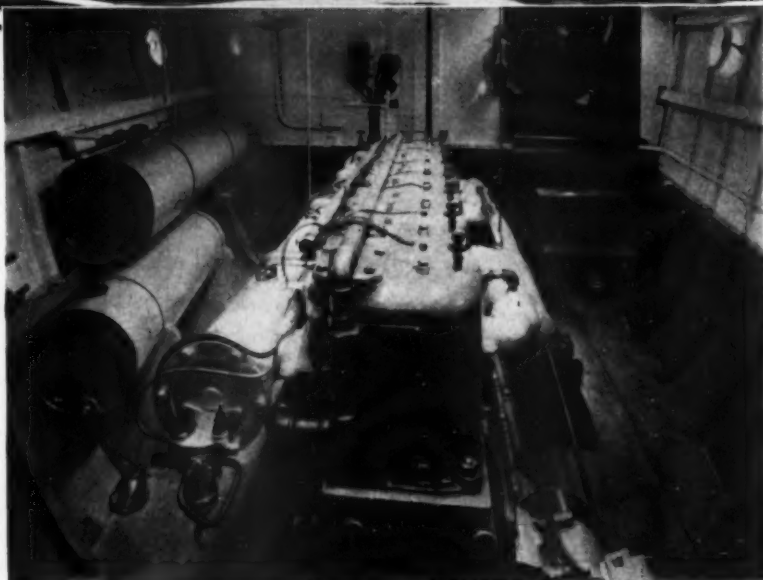
and can maintain a cruising speed of 22 m.p.h. as was demonstrated on a run of 150 miles to Poughkeepsie and return.

The crew's quarters with accommodations for three men are located forward under the raised deck. The engine-room is located just forward of the bridge deck and is lighted by a large skylight and is of ample size so that every part of the power plant is accessible. The engine-room and crew's quarters are entered by a companionway from the bridge deck.

The owner's quarters and galley are in the trunk cabin aft. The main cabin transoms are of the extension type and form wide comfortable berths and also provide ample locker space. The cushions and curtains to match make the cabin very attractive.

Probably the best feature of this boat is the large cockpit aft, with its wicker chairs, table and upholstered lazy-back seat, which is far more comfortable than the deck accommodations usually found on a boat of this size and speed and will be thoroughly appreciated by all who have an opportunity to sail aboard this craft.

The steering gear and engine controls are conveniently located on the large bridge deck which can be reached from the cockpit by way of the side decks. That this



An engine-room to please the most critical. Plenty of room all around the motor and good lighting from the skylight—a combination hard to beat



Looking aft in the owner's cabin showing the well-upholstered transoms, folding table in the center and companionway leading to after cockpit



After cockpit with its wicker furniture, lazy-back seat and a real, serviceable awning. A more pleasant place to spend an afternoon afloat is hard to imagine

Built from MoToR BoatinG's Plans

How One Motor Boatman Took Advantage of a Design Recently Published in This Magazine and Produced a Sea-Going Outboard Motor Boat

By C. L. White

A FIRST vacation spent on the Kawartha Lakes in the Province of Ontario is usually but an introduction to the sport of catching muskallonge and black bass. It does not seem creditable that any fish would be fool enough to try to swallow a bait consisting of a big, bright, whirling spoon followed by three big murderous looking hooks, but partially concealed by red and white feathers. The actual experience of pulling a nice five pound "Lunge" over the gunwale is needed to generate that degree of enthusiasm necessary to evoke the oath that, "I would have a boat, or bust."

It was just this thing which led my wife and me to search through the different magazines for the plans of a boat that would suit us.

Now, as far as I am concerned, any kind of craft will do unless I have to do all the rowing, in which case I look about a bit. Not that I am naturally lazy. Oh, no, but you all know what I mean, I guess. The parties chiefly concerned agreed that we wanted a boat considerably less "ticklish" than the average found in Canada. Thus, in the winter of 1916-1917 we saw that article in MoToR BoatinG, the August, 1916, issue, entitled, "Building an Outboard Motor Boat," by Norman Irving Black. The design suited me exactly and the sub-caption of the article reading, "A 12-Foot Skiff Which Can Be Readily Built by Anyone in Two Days at a Cost of \$10," also suited my ideas nicely, as I had decided to build the boat on my vacation, where both time and money are at a premium.

As I have had previous experience in boat and wood work, not near as much nerve was required as I might easily lead you to believe. Being unable to find more than the first page of the article by Mr. Black, I made up my own bill of lumber. The list which follows differs from my original list in this respect, the mill substituted bass wood for my white pine. They assured me that it was "just as good" and cost less.

I made three changes from the plans by Mr. Black; the length was increased to 13 feet, the mold was moved back to 7½ feet from the bow, and the stern seat moved back to 1 foot 3 inches from the stern.

Bill of Lumber.

- 2 pieces ¾" x 7" x 15' long bass wood for sides.
- 2 pieces ¾" x 9" x 15' long bass wood for sides.
- 4 pieces ¾" x 10" x 15' long bass wood for bottom, seats, etc.
- 2 pieces 7/8" x 9" x 4' long oak, when put together made transom.
- 1 piece ½" x 5" x 15' long oak, for transom cleat and flat keel.
- 2 pieces ¾" x 1½" x 15' long oak, for rub strakes, see photograph.
- 1 piece 2" x 2" x 4' long, for stem and false stem.
- 1 piece ¾" x 2" x 15' long, for ribs, as the sides had to be made in two pieces and these ribs were provided between seats.

This lumber was ordered through my vacation landlord, whose cottage I rent. I had previously obtained a number of estimates which were all considerably higher

than the lumber finally cost me. This would lead one to believe that it does not pay to write for prices from the States as they (the Canadians) seem to think one is made of money.

After ordering the lumber the next thing to do was to pick out the necessary tools and provide a suitable box to transport them in.

The tools were a rip-saw, cross-cut saw, claw hammer, jack plane, block plane, hand

ax, 24-inch try-square, ¾-inch chisel, brace, set of bits, screw-driver bit, nail set, screw driver, putty knife, oil stone and a 2-foot folding rule. Although this may seem to be a large assortment, I found that there was use for every one of them and, except for the try-square, can be packed in a comparatively small space.

It will be interesting to other Americans to know that no trouble whatever was encountered in taking these into Canada. I simply told the officials that they would come back with me at the end of my vacation.

All of the work was done out-of-doors, as Fig. 1 shows. With the mold in place the sides had been nailed first to the stem and then drawn together with twisted rope and nailed to the transom. In the photograph we were fitting the seats, after which we turned her over and put on the bottom.

Of course, before this could be done it was necessary to get the fittings and other supplies and this is as good a time as any to give the complete list of them with the cost that prevailed last summer.

Complete List of All Fittings and Supplies.

1 Lb. 2" wire nails	\$.06
2 Lbs. 1¾" galv. clout nails .....	.30
1 Ball candle wicking .....	.10
2 Lbs. white lead and a little whiting .....	.20
5 Doz. 1" No. 10 flat head screws .....	.20
½ Doz. 3" No. 14 flat head screws .....	.05
5 Doz. 1" No. 8 round head screws .....	.15
1 Quart white lead paint .....	.75
1 Quart yellow floor paint .....	.85
1 Quart gloss white paint	1.10
Spar varnish for rub strake and oars .....	.25
2 Pairs galv. iron oar locks .....	.90
1 Yard jack chain for oar locks .....	.10
20 Feet rope .....	.20
1 Doz. small brass-plated angles with screws .....	.75

Total cost of miscellaneous parts..\$5.96

Total cost of lumber including freight .35 and telephone .15.....\$ 6.00

1 Pair of 7½-foot spruce oars with leathers 4.25 |

1 Canoe paddle for steering when rowing 1.25 |

Total cost boat and oars, etc.....\$17.46

If we add the cost of lumber to that of the miscellaneous parts the total is \$11.46, which is very near to Mr. Black's estimate.

Fig. 3 is simply different views of the finished boat after about twenty-five hours work aided by my wife, daughter and dog. And the interest evidenced by the dog in the process of construction was no little inspiration to the workers. Five hours more were needed to put on the finishing touches and then we see the real results in Fig. 2.

Now, if one does not figure the cost of my labor, I am the proud owner of a boat that cost me little more than the rent for three weeks of one of those



Figure 1.—All of the work was done out of doors

This story gives the experience of one of MoToR BoatinG's readers in building a boat from the designs and instructions as published in our magazine. The cost was a little higher than the estimate owing to an increase in prices from 1916 to 1917, the addition of chain, rope, and angles to the list of supplies, more paint and a better finish, a better pair of oars and a paddle for steering. Many amateurs are able to build themselves a boat, suitable for their individual requirements, from the plans which we publish from time to time. This little motor boat, though designed for an outboard motor, will have a small engine of the regular type installed in it next summer and will undoubtedly prove a success.—Editor.



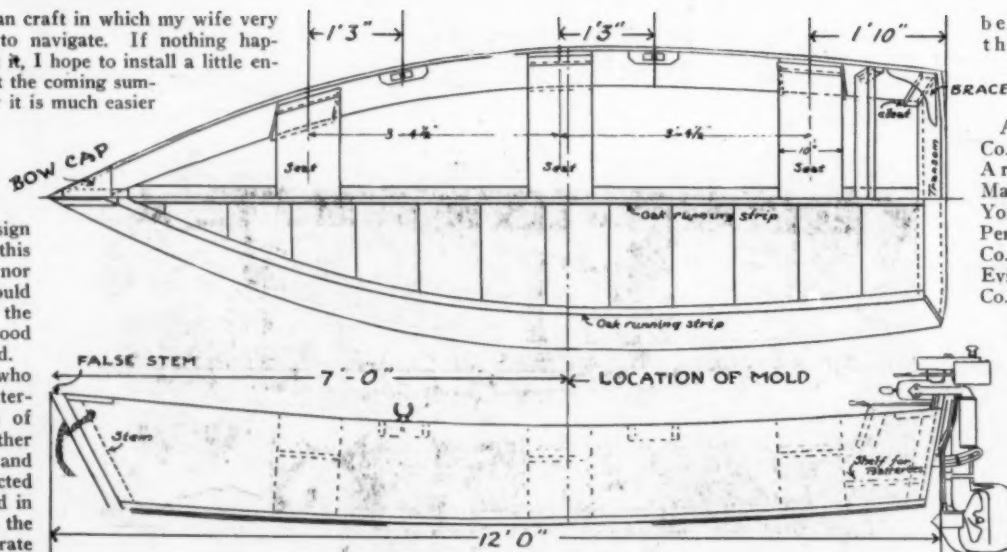
Figure 2.—The final result. A good boat, a good catch and a well-satisfied motor boatman



Figure 3.—These three views show the result of twenty-five hours' work, aided by my wife and daughter, followed by five hours' painting and putting on the finishing touches

narrow Canadian craft in which my wife very much dislikes to navigate. If nothing happens to prevent it, I hope to install a little engine in the boat the coming summer. However it is much easier to row than I imagined it possibly could be. I cannot think of a better design for a boat of this type and class, nor one which would be easier for the amateur wood worker to build.

For those who are really interested in boats of this type, whether of the simple and easily constructed model described in this article, or the more elaborate craft turned out by regular boat builders we give



Half arrangement and half bottom plan and outboard profile of the boat C. L. White built as they appeared in the August, 1916, issue of MoToR BoatinG

below a list of the manufacturers of outboard motors.—
EDITOR.

Aerothrust Engine Co., La Porte, Ind.; Arrow Motor & Machine Co., New York, N. Y.; Caille Perfection Motor Co., Detroit, Mich.; Evinrude Motor Co., Milwaukee, Wis.; Koban Mfg. Co., Milwaukee, Wis.; Sears, Roebuck & Co., Chicago, Ill.

The above manufacturers can supply motors up to 5 h.p. in one or two cylinder patterns.

PRIZE CONTEST

IN QUESTIONS & ANSWERS

Suggestions for Marine Insurance

What the Motor Boat Owners Think of Marine Insurance as Applied to Motor Boats—There Are Many Ways in Which the Companies Could Improve Their Methods

THE PRIZE CONTEST—Answers to the First Question in the December Issue

The Policy Is Fair but the Premium Excessive

(The Prize-Winning Answer)

ABOUT the only simile I can apply to arguments on the subject of yacht insurance is trying to get somewhere by traveling in a circle. But let us look at the matter from all sides and as a first step consider the status of the insurance companies writing this class of business.

Speaking of the eastern part of the United States, the cities of New York, Boston and Philadelphia may be said to do practically all the business and the companies there to represent a standard condition.

Roughly, there are in this section a little more than half a dozen companies and their representatives meet in what is called "The Yacht Conference of Marine Insurance Companies." At those meetings all matters related to yacht insurance in any manner is talked over and a decision reached which incidentally all the companies abide by most strictly. And it may be added here that all those companies are of the soundest financial standing.

First taking up the rates for power boats and auxiliaries, they are as follows:

Amount	Under Five Years Old	Over Five Years Old
Under \$1,000	5 %	6 %
\$1,000—\$1,500	3 3/4 %	4 3/4 %
\$1,500—\$2,500	3 1/2 %	4 1/2 %
\$2,500—\$5,000	3 1/4 %	3 3/4 %

Over \$5,000—there is no stated rate, but general practice is to charge 2 1/2 to 3 %.

Large amounts such as \$100,000 are usually written around 1 1/2 per cent. and these policies contain the "P & I" clause, i. e., protection and indemnity which insures the owner against suit by members of the crew for personal injury, etc.

A boat going to Florida and in commission all year round pays approximately double the above rates and there is a "grounding" clause in the policy exempting damage to propeller and machinery (but not hull) in certain of the shallow Southern waters.

The conditions of the "Standard" policy are roughly:

1. The value of the boat is agreed on between owner and company, which is certainly fair and prevents the red tape of having to prove value in case of loss. If this were not so it would be practically impossible to establish "value" of any boat. Is her value her cost less depreciation, or replacement cost, or what she would bring in open market? No, the so-called "value" clause cannot be bettered.

2. It covers the boat under any and all conditions (such as on the ways) etc., and prescribes cruising limits of coastwise and inland waters (except Lakes Erie and Ontario) from Norfolk to Eastport, Me. This

also seems reasonable as the waters beyond the limiting points certainly present a greater hazard and the limits prescribed give a large cruising radius.

3. It covers the injury to boat and contents against every known accident and against theft of the entire boat, so long as the injury exceeds a small minimum amount, usually \$25 and up according to the value of the boat. I can't say this is a hardship because it would be impossible to permit claims of a few dollars. To inspect and pay same would cost more than the premium and you have to draw the line somewhere.

4. Other stipulations regarding the laying up time of November 1 to April 15 are reasonable as the weather between those dates is most liable to damage floating property and the time allowed in commission is usually ample for everyone.

Where a loss exceeds 50 per cent. of the policy an owner can abandon the boat to the company but the reverse of this is not true—that is, when the loss on a boat insured for \$3,000 is \$2,500 the owner can collect that and still retain the wreck.

There are many other items in the policy outside of the main ones mentioned above, but lack of space prevents stating them, if indeed it is necessary.

Taken as a whole, I think the form of "Standard" policy is exceedingly fair to the owner with the exception of rates, which will be taken up later.

Adjustment is a part that at best never leaves a pleasant impression. I will say that in and around New York all the adjustments have been fair and equable to the last degree. It must be borne in mind that the adjuster is employed by the company and must make a showing to earn his salary. Taken as a whole, they are reasonable men and will do what is fair. I have found the real secret of marine insurance is to insure through a broker who is a yachtsman and understands the game—also one who has the confidence of the companies. Such a man is invaluable and in most cases the company will take the word of such a broker as to damage and adjust the claim without personally inspecting loss, unless it is a very large one, or total. I have seen so many losses so satisfactorily adjusted by a broker of the kind mentioned above that I cannot but believe this is the solution of the adjuster problem.

The companies say with truth that yacht insurance represents but a small fraction of 1 per cent. of their business and is written at a loss. They continue it as a favor to the brokers bringing them marine insurance on commercial vessels and their cargo. They say that the majority of yachts are insured for so small amounts that the premium hardly pays for time of inspecting the vessel, etc., and none of them want to handle boats insured for less than \$2,500, and even at the present rates, the losses exceed the income.

The owner states the rates are so high as to be unreasonable and a vast majority go uninsured.

So it has gone around in a circle with year after year seeing no change and the solution still far distant. It is an undeniable economic condition that if you sell something cheap for which there is a large demand and still make money you will succeed.

So it would be with yacht insurance. If the hundreds of men who carry no insurance could get it at a fair price they would and the fair prices could be brought about first, by volume; second, by proper management. The latter would almost produce it alone. It is ridiculous to draw the only line at "five years

Questions for the April Issue

1. Describe the possibilities of motor boating at night including a list of any special equipment necessary which is not needed in the daytime.

Suggested by A. B., Norfolk, Va.

2. Explain and illustrate a method of laying down roof beams or carlins and a cabin so that they may be saved to the exact crown of the deck.

Suggested by P. G. F., N. Y. C.

3. Explain a systematic manner of inspecting a second-hand motor before purchasing.

Suggested by W. B. M., Newburgh, N. Y.

Rules for the Contest

Answers to the questions, addressed to the Editor of MoToR Boating, 119 West 40th St., New York, must be (a) in our hands on or before February 28, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 28th of February. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions above, any article or articles sold by an advertiser advertising in the current issue of MoToR Boating of which the advertised price does not exceed \$25, or a credit of \$25 on an article which sells for more than that amount. (There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.)

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the next contest, any article or articles sold by an advertiser advertising in this issue of MoToR Boating, of which the advertised price does not exceed \$5, or a credit of \$5 on an article which sells for more than that amount. All details connected with the ordering of the prizes selected by the winners must be handled by us.

old" and say before that the boat is in one condition and after it is in another. Lots of four year olds are wrecks and many fourteen year olds good for years to come. A boat four years old will drag ashore just as easily as fourteen if size and ground tackle is the same. No allowance is made for the owner's sailing experience or knowledge (assuming that he commands his own craft). Why should a man with little or no knowledge or experience pay the same (or less rate if he has a new boat) as the man who has commanded his own boat for twenty-five years and never parted a rope yarn?

The companies say that this is a personal side that they can't go into. They can't with the men handling the business as a side line to regular cargo steamers. You would want a man who was acquainted with the game, its boats and its men. A dozen such are available in this city to-day and would be worth a large salary. Have these men do yacht insurance and nothing else and one man could easily manage an immense amount of business from making the rate to passing on losses. When one company told me that they would not insure my boat for \$1,200 because she was ten years old and would fall apart and the next said she was so valuable that any reasonable injury would probably result in damage beyond the figure I sought to insure for, it shows something is wrong. Incidentally, that boat is now seventeen years old and as good as the day Lawley launched her.

I know many men whose boats I would not insure for 25 per cent. and many others who would be a good risk at 1 per cent. Why

make no distinction between good and bad gasoline tank installation or condition of engine room?

The whole idea is wrong and because it is wrong the rates are prohibitive to the owner and the losses great to the company.

A small—very small—expenditure for advertising, a rate based on what the boat really is and what her captain knows, a "Walking Yacht Register" in sole charge of the business and you will have a combination writing insurance at a low rate to an army of yachtsmen and paying fat dividends to its stock holders.

H. A. J., New York, N. Y.

Insurance from a Broker's Point of View

AS an insurance broker I am willing to concede that anyone who has paid premiums year after year without suffering a loss feels like kicking himself. But is he entitled to do that?

When the wind is blowing seventy miles an hour and the waves are piling up he can go to his comfortable bed at home and closing his eyes, remark, "I should worry."

Worry is admittedly the worst affliction we mortals have to bear. Therefore, the insurance company that has the liability and the worry is entitled to compensation and I for one will swap worry for money any time.

Usually the man who says he does not believe in insurance is the one that cannot afford

it. It is a well-established fact that the wealthier people believe in every form of insurance and therefore carry it.

The big question in insurance is "Can I afford to lose my property?" If it will not bring financial hardship (and how can that be) in case your boat is destroyed by fire or the elements or you have to pay a bill for damage done to another man's boat then I say take the risk yourself. But I ask how many men have the money ready to invest in other boats if they lose their present ones?

From the fact that the insurance companies are not anxious to take the risks on boats under \$1,000 in value, it must be evident that the business is not profitable to them. I know that one company lost \$30,000 net in one season on small yachts and there is not a season that I do not have claims to pay.

It is well to understand that marine insurance protects against loss by fire, collision, storms, also against injury to other boats and also against injury to the machinery due to latent defects (when the value is over \$2,500) unless in the control of the owner.

If you moor in a quiet stream you might carry the risk on the marine end but the hazard of fire is present winter and summer.

After all, the cost is not much considering the ever-present risks and the protection given. Count it in with the other expenses and get rid of the worry of wondering whether you will meet with a mishap.

You insure your house, furniture, business, automobile and your life because they are of value. Isn't the boat worth anything?

V. E. M., New York, N. Y.

First Aids to Boat Building

Home-Made Devices That Have Helped the Amateur Over the Rough Spots. These Simple Tools Will Save Many Hours of Hard Work

THE PRIZE CONTEST—Answers to the Second Question in the December Issue

Some Devices That Will Be a Great Help to Amateurs

(The Prize-Winning Answer)

WITH the numerous mechanical aids and devices now on the market it becomes a rather difficult task to select from our own store of home-made devices such articles as would possibly appeal to the amateur boat builder. Taking into consideration the inconveniences usually attendant with the building of a boat by the amateur. I have shown a self-clamping lever that is useful when bending frames or ribs over a drum. As we are all probably aware that a band of iron laid over a rib or frame when bending prevents it from splintering or shredding, so this clamp lever takes the place of a screw clamp which necessarily must be screwed very tight to prevent slipping, thereby losing time and permitting the steamed rib to cool off. So this lever overcomes that lost time.

The harder you pull on this lever the tighter it grips. A number of wedges and hooks should be handy so that a number of frames may be bent in succession. The design is self-explanatory and the various part may be made by the handy amateur.

Another handy contrivance is a bit guide used for boring for slip dowels when making sash panels, etc. It is particularly useful for making long bores as it starts the bit true

and holds it square to the surface and parallel to the sides. When long borings are made, it is advisable to use a flat-foot ship auger, for the worm has a tendency to follow the grain of the wood and throw the bit off. Referring to the design you will notice that the largest tube is fixed solid by brazing or expanding in the face plate; the guides are pieces of tubing each 1/16 inch thick and graduated from 1 inch to 3/8 inch. Pieces of hard wood turned to fit

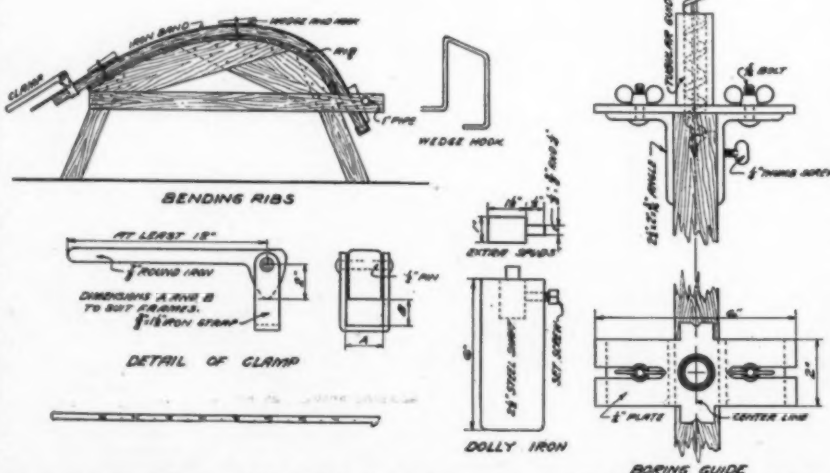
of shaft. These spuds need be only of such sizes as are needed.

The advantage of this device is that the one iron serves all the needs as required and, furthermore, when the hole is to be plugged it prevents the edges from being spoiled, thus making a poor fit for the plug.

Last but not least is a length gauge for bolts, rivets, etc. It is made of a piece of square brass or steel rod marked in inches. It can be of any length required or several of different lengths can be made. Its use prevents the necessity of jumping in and out of the boat when boring for bolts or rivets. Simply push the gauge through the hole, draw the hook up tight against the other side and you have the length of the bolt or rivet needed. The use of these accessories by the amateur will be appreciated inasmuch as they will save him a great deal of time and vexation when he starts building his own boat.

T. P. K.

New York, N. Y.



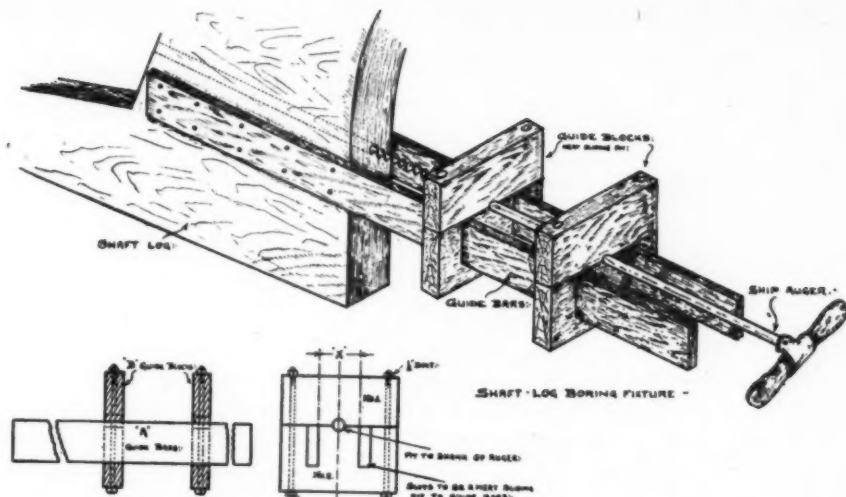
T. P. K.—Several devices which will help the amateur over some of the difficulties of boat building

the largest tube and accurately bored for the bit will do if tubing is not available. The rest of the design is self-explanatory. The angle-iron clamps are movable to suit various thicknesses of wood to be bored.

A most convenient and simple arrangement for a dolly iron which may be used for riveting and clinching is shown in an accompanying illustration. A number of spuds may be made to fit the larger hole in the end of the piece

A Guide for Boring the Shaftlog

ONE of the most exacting tasks that confronts every amateur in building his own boat is the boring of the shaft hole. To bore out a neat, continuously true and straight hole in the center of a solid oak shaftlog is by no means an easy job even under the most



C. E. B.—A guide for the auger that will be appreciated by anyone who has tried to bore a shaftlog

favorable conditions. In order to facilitate the work a simple boring fixture capable of guiding the auger is a necessary device.

The accompanying sketches illustrate the manner of constructing a simple boring guide that will greatly aid the amateur in satisfactorily completing this particular piece of work. To make the fixture as shown, first procure two good straight pieces of cypress or clear spruce. Have the same planed at the mill to about $3\frac{1}{2}$ or 4 inches wide by 1 inch thick and cut to the length that is needed; these to be used for the side guide bars as at A. Next from stock sided about $1\frac{1}{2}$ inches thick make the guide blocks as at B, carefully cutting slots as shown to a neat sliding fit for the guide bars with distance between the slots (as dimension at X) just equal to the thickness of the shaftlog. At the parting line of the two pieces (Nos. I and II) with same clamped firmly together and exactly in the center of dimensions X, bore a neat hole, a nice running fit to the shank of the auger. Keeping pieces I and II clamped together, bore down through both pieces carefully with a $\frac{1}{2}$ -inch drill at each end and insert a $\frac{1}{2}$ -inch bolt or threaded rod with a nut at each end for holding the pieces permanently together with bolts as shown and described. Cleats of hard wood can be screwed firmly at both ends of pieces Nos. I and II, should it be preferred.

With guide then completed and the angle of the shaft hole determined, it is a simple matter to fasten securely the guide bars A (with their top edges coinciding with the center line of the proposed shaft hole) to the sides of the shaftlog. Use an auger without the screw end, for the screw has a decided tendency to run off center and follow the grain of the wood. Exercise a little care and don't hurry the job and the result will without doubt be all that you desire.

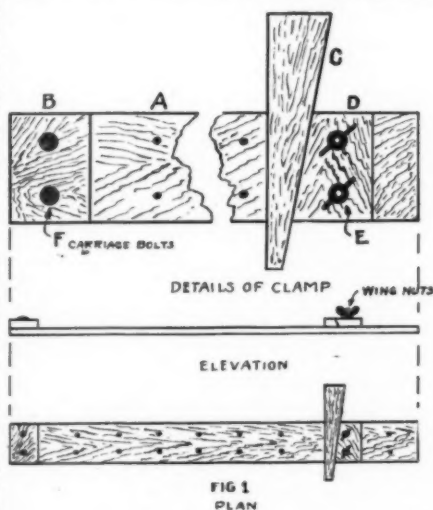
C. E. B.
Fall River, Mass.

A Clamp Which Can Be Put to Many Uses

THOSE who have built their own boats and especially those who have been compelled to do the greater part of the work single-handed will appreciate any device which will facilitate and make the work more easy.

It seems fair to presume that most everyone who has been fortunate enough to possess the skill required in building his own boat has at least contrived and developed one device that will enable him to execute some particular part of the work more quickly, better and without the aid of expensive equipment.

The device shown in Fig. 1 is simple, practicable and inexpensive and has been found by the writer to be invaluable for many kinds of work found in the building of small boats. Shipbuilders' clamps are too expensive for one who is not actively engaged in the boat build-



H. H. H.—A clamp which can be used for the joiner work

ing business, and it is the purpose of the device shown to be a cheap substitute for the former.

The clamp, as the device may be properly called, has many uses around the boat shop such as drawing up planking, decking, etc., where a good joint is desired and is especially well adapted for joiner work and the building of doors, hatches and the like. No dimen-

sions have been given as these will vary for the particular work in hand. It will be found, however, that several clamps 30 inches long and built proportionately heavy for the class of work undertaken will be suitable for most work. The beam A in Fig. 1 should be of well-seasoned oak, ash or in fact any tough wood may be used. The head B and wedge C should be made from some soft wood such as pine, spruce, cypress, etc., in order that the work will not be marred or injured.

Fig. 2 illustrates one of the many uses to which the clamp will be put and with this simple suggestion the prospective builder will find many and varied uses which will readily present themselves during the course of construction.

H. H. H.,
New York, N. Y.

Three Useful Home-Made Tools

IT is desirable sometimes to bore to a certain depth and no farther. Some carpenters tie a string around an ordinary bit to accomplish this, but Fig. 1 shows a method that prevents the creeping process that is apt to accompany the use of string by an amateur.

The collar used in the case illustrated is made of wood and there ought to be several lengths and diameters on the work bench ready for use when boring plug holes in the planking, mortising, etc.

Symmetrical parts may be scribed by folding heavy wrapping paper and drawing the half section thereon, the dividing line being AB. One cut of the scissors gives like parts and the pattern can be easily transferred to the wood.

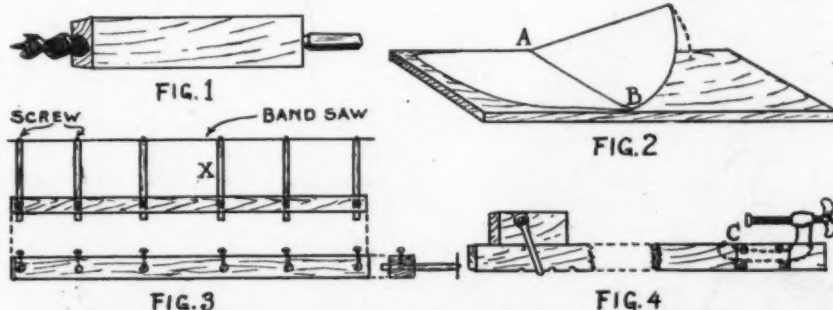
Fig. 3 shows the use to which an old band saw may be put. Most any boat shop has one or more broken lengths that can be had for little or nothing, and as shown a very practical adjustable templet can be made therefrom. The back is made of any stock $1\frac{1}{2}$ inches by 2 inches and of a length to suit the user. The rounds (X) are $\frac{3}{4}$ inch and spaced a foot apart.

The saw is attached to them with screws passing through holes drilled in the saw. As is evident the longer the rounds the greater the radius. The adjustment is made with the screws at D. For getting the curve of the carlins, the cut of the covering board or working up to full size from the table of offsets, this affair does its work as well as the high-priced article. Short pieces of band saw make excellent scrapers.

Fig. 4 is a bar clamp, the screw of which is an ordinary screw clamp, the claw of which has been cut off. The clamp is countersunk as the dotted lines indicate and a three-sided iron collar bolted over it. This collar engages the clamp at C and the strain is distributed among the bolts.

The back block is held by a U-shaped swivel bolted to the block and gripping the bar in the half round holes at the bottom.

J. E. M., New London, Conn.

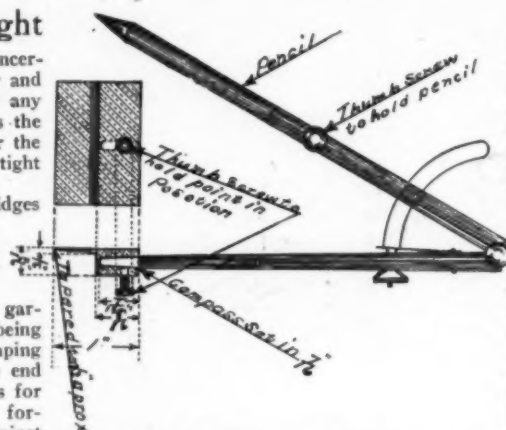


J. E. M.—Three home-made devices easily made by anyone who can use wood-working tools

To Make the Planks Fit Tight

WILL the boat be tight? This uncertainty is the cause of more worry and giving up building a boat than any other reason. The fitting of the plank is the most difficult part of the construction for the amateur, as poor seams are hard to get tight and harder to keep tight.

The device shown in the illustration bridges me (an amateur) over this part of the construction, as I am not obliged to take splittings and am sure of a perfect fit. The device can be used on every plank excepting the bottom edge of the garboard or that fastened to the keel, that being taken with the compasses alone by clamping the plank in place with the side at each end against the keel and setting the compasses for the widest space and proceeding first forward and then aft, keeping the point against the keel and using a pencil for the other point.



M. M.—An attachment for a compass that is a great help in fitting the planking

When the garboard is fastened in place the device can be used on all the other planks. By clamping the board in place with the compass guide resting against the top edge of the garboard plank, set the compasses at widest space and mark as we did on the garboard.

The device can also be used for getting the rabbet on the stem by setting the compasses as wide as we wish the outside of the stem and marking, keeping the guide against the outside edge of the stem. In using this device the procedure is as follows: mark and fit plank lengthwise first, then saw off end if projecting by stem. Mark end of plank as we did the rabbet, thus insuring a perfect fit endwise, then mark the width.

The writer made the device out of a piece of bronze shafting, sawed out with a hacksaw and smoothed with a file in less than three hours' time.

M. M.,
Brooklin, Me.

Restoring Scored Cylinders

There Are at Least Two Methods Not Requiring Machine Shop Facilities—A Smooth Finish the Most Important Part of the Process

THE PRIZE CONTEST—Answers to the Third Question in the December Issue

Grinding with an Oil Stone Put This Motor Back into Commission

(The Prize-Winning Answer)

THE third question in the Prize Contest section of the December issue brings to mind repairs made on two motors a short time ago. The motors in question had their cylinders scored through the use of machine oil for cylinder lubrication in place of gas engine oil, the error being made in filling the lubricators after dark without the aid of a light.

As these motors were located about 140 miles from the nearest machine shop and it was necessary to make repairs on one without delay, the following methods were resorted to.

The cylinder of one motor was removed from the base and laid on the bench. The outside of the piston thus exposed was found to be somewhat rough and was therefore smoothed up by grinding down with an oil stone. This same stone was taken to the grindstone and the edges rounded over and the inside of the cylinder then smoothed up as much as possible.

The rings were smoothed up in the same manner as the piston and were turned around in the slots so the scored surfaces would not register with those of the piston and the cylinder.

The motor was then assembled and started up, using a somewhat heavier oil than had been customary. A telegram had been sent to a company manufacturing an oil combined with graphite (Oildag) and on the arrival of this oil some few days later it was fed into the motor with the result that in about a week or ten days the compression was nearly normal. This motor was run the balance of the season—about three months—without further trouble and there seemed to be no decrease in its power. When pulled down at the end of the running the scores in the cylinder walls and those in the piston were found to be well filled with graphite and the cylinder has never been rebored.

The second motor being more deeply scored than the first, an oversize piston was ordered from the manufacturer by wire and upon its arrival the cylinder was clamped securely to a bench, a wooden handle was fitted to the old piston, and using this as a lap the inside of the cylinder was ground out, using plenty of oil and some carborundum on hand for valve grinding. In lapping out the bore the

piston was given a rotary motion so as to produce as accurate a job as possible.

While the task seemed endless at the start it took only about three and one-half hours of grinding to remove the scores and give the proper clearance to the new piston.

The new rings which had been ordered with the piston were then fitted, the motor assembled, given plenty of oil and started under its own power. It was run at about half throttle for a week, and then as there were no indications of further trouble resumed its normal task.

It may prove of interest to know that this same motor is still in service and that the cylinder has never been rebored.

E. J. S.,
Springfield, Mass.

A Ready-Prepared Cement Satisfactory for Deep Scoring

WHILE there may be other methods of repairing scored cylinders under the limitations imposed by the question, by all odds the most practical and satisfactory is that which entails the use of Smooth-On iron cement. On the dexterity with which a mending operation of this kind is made, of course, depends the success of the job, but if the work is done well the repair will be fully as permanent as the cylinder itself.

In a marine engine, due to its pitch and the thrust of the shaft, it usually happens that a score comes at the aft side of the cylinder wall, the wristpin having projected out of its bushing to the rear. When your engine fails to deliver its power, therefore, and fires into the crankcase, here is the place to look first. If the score is only a slight one, it may as well be admitted that the Smooth-On will not perform its duty well, but if the cut is deep and jagged (as frequently happens), conditions are right for a permanent repair. Dilute your cement with sal ammoniac to give it its proper holding power, remove the piston from the cylinder and proceed as follows:

Apply the cement to the score with a whittled stick, and while the preparation is still wet run the piston through the cylinder and back. This will remove the superfluous cement and give the remainder a rough finish. The rings should first be removed from the piston, however. Allow the cement to harden over night and then with the rings in place, on the piston try to pass it through the cylinder again and with bearing scrapers shave off the high spots until the rings slide up and down the

repair with just the proper clearance. Finally, wash the inside of the cylinder well with gasoline-soaked waste and the repair is complete.

I have put this process to the test on wheezy and debilitated motors of both the land and sea-going varieties, and not once has it failed of its purpose. Engines which have been so scored that it was possible to stop them by the mere application of pressure to the fly-wheel have developed full power under test after mending; consequently, for badly scored cylinders I prefer the use of Smooth-On to the more costly and troublesome methods of repairing by welding or by regrounding.

S. C.,
Brooklyn, N. Y.

Cement Proved Satisfactory in Repairing This Engine.

THERE is but one practical method of restoring a scored cylinder without machine shop equipment and experience; that is, by the use of an iron cement which metalizes soon after application. When metalized its texture and color is similar to cast iron. Patent prepared cement is better than that made from any formula you could find and prepare without experience.

The scored part is thoroughly cleaned out with a file and scrapers and then the cylinder is heated to a temperature of from 225 to 230 degrees Fahrenheit. The Smooth-On cement is also heated and applied in a very thin coat. When this first thin coat has hardened, the second coat is applied to it and in that way the scored part is built up. By applying the cement in thin coats it will harden more quickly than when one thick application is made. The mixture should be of the consistency of thin putty for this work.

All rust and foreign matter must be thoroughly removed and the metal well cleaned before applying the cement. A clean, rough surface is much better for the cement than a clean smooth surface.

The casting may be heated by means of a gasoline torch or by turning live steam through the water-jacket and the heat should be maintained through the entire period of applying the successive coats.

The finishing may be done with files and emery cloth without any machine shop equipment. An oak block three or four inches thick is turned or sawed to such a diameter as will just enter the cylinder bore. A notch is cut on an angle of 45 degrees across the circumference of the block to take a piece of

file set on edge so that just the cutting on the file is exposed. Then the file is ground to conform to the block and used as a scraper by revolving the block through a short distance of the circumference. This will soon rough down the surplus iron cement. A thin strip of canvas or leather around the blocks will increase the diameter for another cut.

For a very smooth finish, V-shaped notches may be cut on the circumference of the block 45 degrees apart and fine emery cloth stretched and tacked to the notches. The finishing-up

abrasive must be very fine. Fine valve-grinding compound may be used on leather for this. The improvised grinder will require wetting with kerosene or turpentine when using the emery cloth. The bore should be kept wiped clean of cuttings or loose abrasive and a little care not to cut the surrounding metal is necessary.

After the bore is worked down so that the piston, with rings on, fits as before, the parts should be thoroughly cleaned to remove any emery or particles of metal which if left would

soon work worse havoc than the score.

This cement firmly adheres to iron and hardens into a compound whose texture is similar to cast iron, produces a good wearing surface and is fire-, steam-, oil- and gasoline-proof when hardened.

The repair is not temporary. It is permanent and lasting. An incident could be cited where a cylinder repaired as above has withstood two years' service in a heavy-duty motor and was then the best one of the four.

W. B. M., Newburgh, N. Y.

MoToR BoatinG's Six Practical Handbooks

The Prize Contest Answers for the Last Eight Years Taken as the Basis for a Valuable Series of Handbooks Just Published

MoToR BoatinG has just published a series of six books which is known as *MoToR BoatinG's Practical Series* and which, without doubt, form the most complete and valuable library on the subject of motor boating that has ever appeared in print. Each of the six volumes is complete in itself and, taken collectively, there is no phase of the sport which is not thoroughly covered.

The Prize Contest Department of MoToR BoatinG is universally recognized as being productive of the best thoughts and ideas of the most practical motor boatmen in the world. What better could we do then than to take as a basis for our new series of books these same thoughts and ideas which have proven so satisfactory and successful. Therefore, we have taken the best of the Prize Contest answers with many of the illustrations and have produced six very interesting volumes, each one of which is brim full of information and suggestions for the motor boatman, and which no one can afford to be without.

The titles of the handbooks are as follows:

- Volume I—Practical Motor Boats and Their Equipment.*
- Volume II—Practical Motor Boat Building.*
- Volume III—Practical Things a Motor Boatman Should Know.*
- Volume IV—Practical Marine Motors.*
- Volume V—Practical Motor Operation and Maintenance.*
- Volume VI—Practical Suggestions for Handling, Fitting Out and Caring for the Boat.*

Vol. I tells you all about what the ideal boat for the various kinds of service should be; the points to keep in mind when selecting a new boat or purchasing a second-hand craft. The best proportions for a hull, many suggestions for interior and exterior arrangements, whether the boat should be round- or V-bottom, the best bows and sterns for the various types of craft; and how to tell whether a hull is seaworthy or not are all explained

in full. All about steering gears, rudders, the electrical equipment, lighting outfits, wireless, tenders, galley arrangements, galley stoves, running water and all the rest of the cabin equipment.

Vol. II contains full information and instructions for building a boat from the keel up, including laying down the lines, the best woods to use, various kinds of fastenings, the steam box, joints, framing and planking, boring the shaftlog and limbers, fitting stern bearings and the stuffing box. Tells you how to build a water-tight hatch or window sash; the companionway and skylight, fitting the port lights and coaming, canvassing the deck. Vol. II also takes up the construction and installation of the various necessary fittings, such as the awning and windshield, the signal mast, the spray hood, the ice-box, removable davits, boarding steps, extension and pipe berths, the engine housing, the helmsman's seat, etc.

Vol. III will tell you everything you should know about your own boat, boats in general and boating, whether you are a beginner or a deep-sea navigator. This volume will give you a great mass of information which you should have. It will tell you how to steer and why many boats steer badly; how to plan for a cruise and how to cruise; how to increase the factor of safety as well as the factor of enjoyment; all about charts and the compass, tides and storms and how to allow for each; how to use storm oil and get off bottom if you go aground. Racing and race courses are taken up in detail, how to handicap boats and arrange novel events for regattas and club days handling ground, tackle, navigating, etc.

Vol. IV will tell all about the marine motor, what it should be and what it should not be, whether it should be short-stroke or long-stroke, high-speed or heavy-duty, and why the automobile motor will not do. It will tell you where the best location for the engine is and describe the ideal engine bed and the best way to get the motor aboard, line it up and place it in the boat. How to power the cruiser, open boat, yawl, canoe, hydroplane and

rowboat are both described and illustrated. The fuel tanks, where they should be located and the best way to connect them up. Various kinds of exhausts, both above and under water, the ignition systems, high and low tension, propellers, batteries, etc.

Vol. V deals with the running of the motor and its care and upkeep—how to get the best results out of your power plant, more mileage and the things which should be done each spring before putting the motor into commission. It takes up repairs to the cylinders, water jacket, pistons, a burned-out bearing, etc. It tells you how to adjust your carbureter, how to remedy poor compression, how to remove a piston ring, and how to fit a gasket. The problems of low-grade fuel and kerosene are solved. Lubrication troubles are given attention, and practical advice given on this subject. Starting in cold weather, clean and quiet motors, locating motor troubles, timing, setting the valves, freeing the frozen piston, cleaning the water inlet, grinding the valves. These are but a few of the subjects which are taken up in Vol. V.

Vol. VI is the book which contains real information as to the proper methods of handling your craft under all conditions, fitting out and going out of commission, and deals in detail with the proper care which every boat should receive. Whether you are a beginner or the most expert expert in the world, you will find points which you never dreamed of before. This volume will tell you all about the upkeep of a boat, the paint, bright work, how to launch and haul out even without a marine railway. The proper precautions to take to preserve the wood both from the outside and inside, replacing a broken plank or other injured part, ventilation, moorings, stopping the leak, auxiliary sails, etc., etc.

Each volume consists of nearly 200 pages and is fully illustrated. Several very attractive offers have been arranged for supplying the books of *MoToR BoatinG's Practical Series* to our subscribers, and we suggest that every one read these offers printed elsewhere in this issue.

Photographs by
Brown & Dawson



Many cities are using motor patrol boats to protect the water-front. The illustration shows a motor boat armed with a machine gun that is used by the Police Department of a city on Long Island Sound for patrol work in the harbor and along the docks

Motor Boats Doing Duty Over There

The Service Performed by Submarine Chasers, Sectional Patrols and Motor Launches Is But One Use to Which Motor Craft Are Being Put—Even on the Inland Waters They Are On Duty

Photographs by Pictorial Press

WHEN motor boats are spoken of in connection with the war, the type of boat first pictured in the mind is a speedy submarine swatter, armed with two or more guns and able to remain at sea for days at a time. Motor boats of a less spectacular type performing the unromantic duty of acting as ferry boats and canal boats are doing their bit in France.

The steel pontoons, used when necessary to construct bridges for the army, are at other times fitted with an outboard motor and used in the transportation service on the rivers and canals. The carrying capacity of these pontoons compares more nearly to that of the life boat than to an ordinary open motor boat.



Motor boats as an aid to the temporary bridges. French reinforcements being taken across the Meuse River



French troops boarding pontoons for transportation on one of the canals

Although the lines of these boats are not what would be considered graceful for a pleasure craft, they are driven easily through the water even when heavily loaded. They are built for service, with no fussy trimmings or



German prisoners being taken to the rear along one of the canals somewhere in France

of the boat in the canal gives evidence of the power developed by these large multi-cylinder outboard motors.



Chinese Mission in pontoon with outboard motor on Meuse River

equipment to get out of order or become damaged. The size of the mooring bits are an evidence of the ruggedness of the construction of these boats.

The outboard motor is much more powerful than any in use in this country. It will be noticed that the steering gear is a wheel on an inclined shaft and does not follow the practice of having the whole engine turn as a rudder as is customary in this country. The wake



German prisoners being transported on the Meuse River

My Ideal Runabout

No. 1, Tuna, a 27-Foot Shallow-Draft V-Bottom Craft

By Howard A. Pike

NARRAGANSETT BAY, that beautiful sheet of salt water which lies within the borders of the little State of Rhode Island, has a very unpleasant way of becoming quite rough and nasty on too numerous occasions during the summer months when we would a sailing go.

On these somewhat pleasant but windy days, when the waters are lashed into short steep waves with foaming crests caused by the comparatively shallow water, the ordinary runabout with its rather low freeboard is apt to become a pretty wet proposition to handle and while some people don't mind a little wetting, others do care and they seek the protection of the cruiser with its higher freeboard and abler sea-going ability.

There are plenty of able cruisers on Narragansett Bay but the fast runabout and speed boat are not much in evidence owing to the rough conditions usually met with, in fact a good able runabout suitable for these waters is quite a stranger here.

It is in the face of such conditions that my ideal runabout must be launched. Considerable thought must be given to the shape of the hull, the freeboard with good flare forward to turn down these short steep seas and the amount of power to drive it to obtain the maximum pleasure and efficiency. Also in my case a whole lot of thought must be given to the purse out of which will come the where-

My Ideal Runabout

This is the first design of the runabout series which was announced in the December issue of MoToR Boating. It is a rather novel design for a runabout to meet two radically different conditions. A boat to be used in the shallow water of the harbors about Narragansett Bay and at the same time to be seaworthy and reasonably fast for fishing trips out on the rough waters of Block Island Sound. For a runabout of this size, 27 feet long, 6 feet 8 inch beam and 18 inches draft, she is a remarkably complete and roomy boat.

The interior arrangement with the operator forward, the motor under a real trunk cabin amidships where it is protected from the elements and a roomy cockpit aft is a layout that can hardly be improved upon for use in rough water. The high freeboard, ample flare and reserve buoyancy all help improve the sea-going qualities while the tunnel effect in the underbody allows for navigating shoal water. Altogether Tuna is a fine example of what the amateur can do in the way of designing a boat to meet his individual requirements.

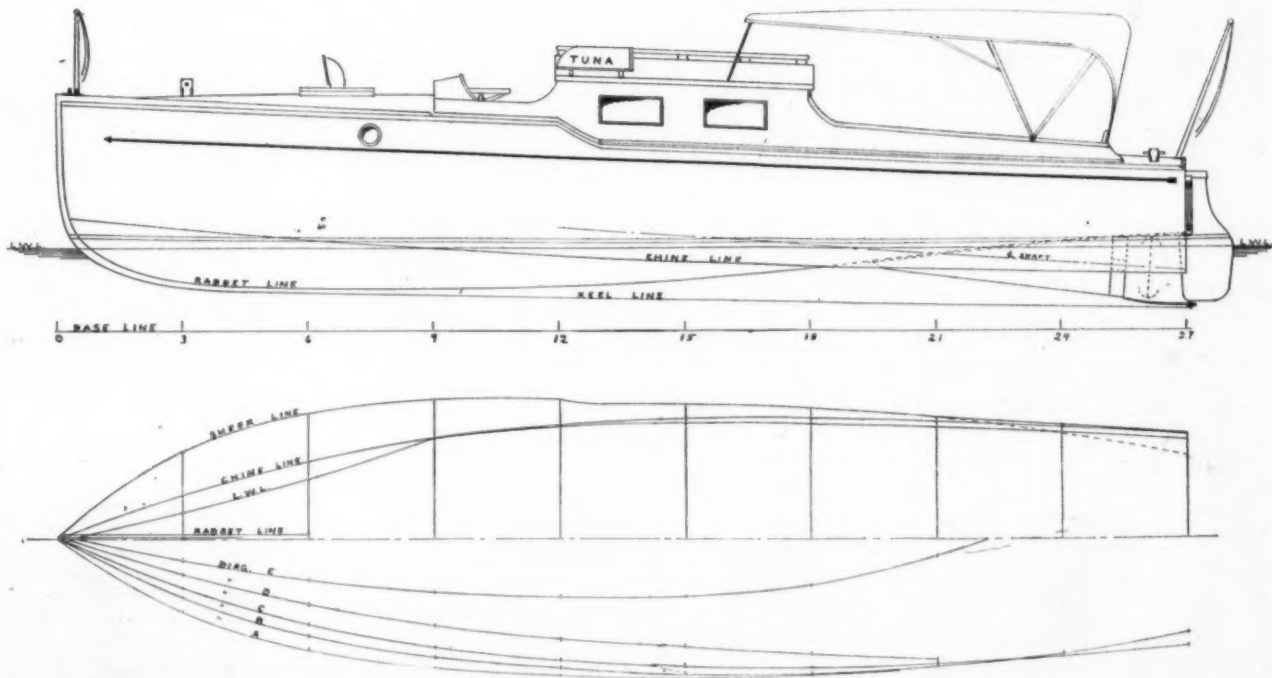
Several excellent designs have reached us but there are possibilities for many more. You have a chance to win the \$115 prize we have offered. Be sure to read the conditions on page 29.—Editor.

show considerable seaworthiness to be useful.

After considering all the above I think I have produced one type of runabout for use on Narragansett Bay which is also capable of making short runs out to sea under fairly good weather conditions.

For my use a runabout of 27 feet over all, 6 feet 8 inches beam and with not over 18 inches draft is large enough. The type of hull is the V-bottom because I am a thorough convert to this type for power boats of the smaller size whether designed to travel fast or slow if they are properly designed. Several years' experience with both V- and round-bottom types has taught me the advantages of the V-bottom which I cannot overlook and which seems to be taking root in the minds of the most skeptical at last.

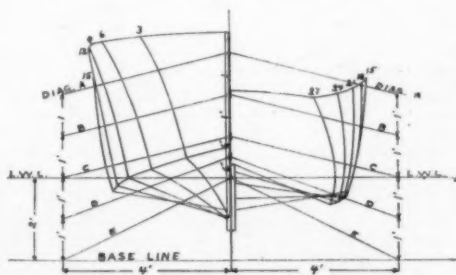
To obtain shallow draft with this type I have worked a reversed V in the sections aft in which the propeller will turn. At rest the tips of the propeller are above the waterline but after starting ahead the tunnel, as I will call it, is filled with water and kept full by the movement of the hull over the water and through the medium of the deep chines and insloping sides of the underbody at this point. Also the water is not so broken up as one would suppose and very little efficiency is lost at the propeller. When at full speed the wake aft is rather peculiar to look at and some experiments which I made show very few faults



with-all to settle with the boat builder. A hull with quite a shallow draft is very important, if you wish to go poking into the several small and shallow harbors which are numerous about the bay.

The fellow who sticks to the deeper channels seldom sees more than one-half the sights and fun which can be had in these out-of-the-way places.

There will, of course, be plenty of days when the elements are most kind and on these days we will enjoy to the fullest extent the pleasures of runs about the bay or some delightful fishing trips after that gamey fish, the tuna, after which the boat is named. These trips will take us out of the bay on old ocean around Block Island where these fish abound and here is where a shoal-draft boat must

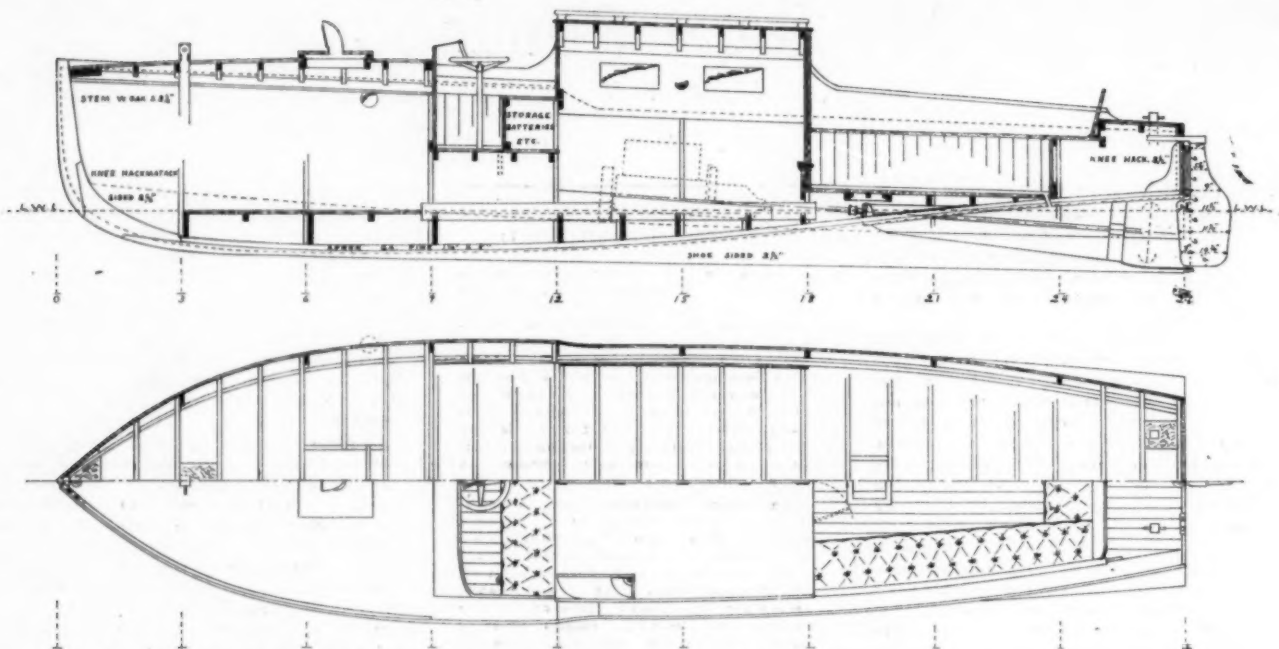


Outboard profile and lines of Tuna. Scale, 1/4 inch equals 1 foot. These show clearly the method adopted to secure a shallow-draft boat and at the same time one that is seaworthy and fast

with this type of V-bottom hull.

The engine I have selected to drive this runabout is a Kermath Vanadium 20 and I expect a speed of 15 miles under favorable conditions using a wheel 16 inches in diameter by 20 inches pitch turning at 1,000 r.p.m. For comfortable and dry going this speed is about the limit on these waters and the low cost of operating this power plant better fits my purse.

The engine is to have the place of honor on this boat within a shelter large enough for me to enter through a door in the after end and where I can be seated on either side of the engine to clean or work on it and yet be able to sit erect with my head just clearing the



Inboard profile, half deck and half deck framing plans showing general interior arrangement. Note the well-protected motor compartment and the location of the operator's seat well up where he has an unobstructed view

carlins. This is quite different from the usual practice on runabouts where one has to open hinged hatches and shinny over a bulkhead or stand on one's head to get at some part of the machine, and if it is raining or there is a slop on things about the engine usually become soaked. In this engine shelter of mine there is plenty of room for stowing and taking good care of the things which must be carried aboard and which can be kept locked up fairly secure.

Forward under the raised deck there is plenty of space for stowing ropes, anchors, etc. Entrance to this space is through a large hatch on deck. Also a cowl ventilator in this hatch provides ventilation under the deck, some going back to the engine space. One five-inch port on either side provides some light and adds a little to the looks of the boat from outboard.

Between the forward deck and the engine shelter is placed the steering cockpit. This space is but 3 feet fore and aft and has a seat extending the width of the boat which is large enough to accommodate three people. In this space is arranged the usual runabout steerer which is set vertical and contains the engine controls. A cowl dash is built in forward having the necessary gauges, switches, etc., mounted upon it. A water-tight floor with one-inch scuppers draining outboard at each after corner completes this space.

Aft of the engine shelter is a good size cockpit 7 feet long with seats on both sides and one athwartship aft. These will seat eight people. On either side, one under each seat, are the gasoline tanks, cylindrical in form,

of twenty-five gallons capacity each. A vacuum system of feed will be installed, as the tanks are rather low for gravity direct to carbureter. A flush hatch is set in the floor over the patent stuffing box and shaftlog which will allow the inspection and tightening of the box. A folding top of the usual runabout variety will help to make this space comfortable on hot days.

The rudder, of oak, is hung on the transom with the sliding tiller arm projecting through a slot in the transom. The steering cable is of bronze running over large diameter sheaves at the corners and through guides placed in the frames. The tiller is reached through a large opening in the top of the after seat.

In regard to the hull itself I am of the opinion that with the 3 feet, 6 inches of freeboard forward, the generous flare and good reserve buoyancy, the seas will be kept from sweeping over the deck, and while the speed is comparatively low for a runabout it is more desirable than high speed would be considering the conditions peculiar to this locality.

The material entering into the construction of this runabout is heavy and strong enough for a cruiser of the same length but strength is necessary in this case and speed is not.

In these troubled times when the price of brass is so high I shall feel compelled to use the best galvanized fastenings and fittings

which I can buy using brass and copper only where it is necessary.

I think the selection of the Kermath Vanadium 20 was the proper caper because it is a standardized product with great strength in all engine parts and of great durability. Also the price is reasonable and it has a good record, but I wish all manufacturers of marine engines would wake up and cast the lugs or extend the base so that the bearers can be run past the flywheel. To overcome this one defect I am going to use a 15-inch diameter flywheel instead of the regular 18-inch wheel and then I can run the bearers forward just clearing the flywheel.

Of course, my ideal runabout will be equipped with an electric starter and lighting outfit controlled from the driver's seat as I feel they are quite essential to the modern boat of to-day and if she don't sink because of all the good things I am going to put aboard, we will have lots of fun aboard her poking around those shallow spots I am thinking about at this moment and the hooking of some tuna on pleasant days on Block Island Sound.

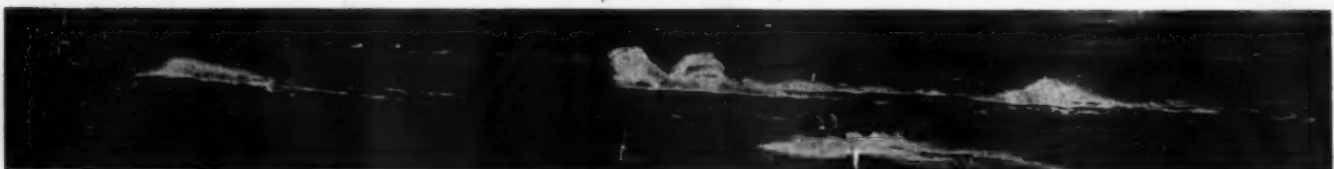
With the cockpit cover down, Tuna has the appearance of a small bridge-deck cruiser. In fact the lines are almost identical with those of a cruiser except that they are on a smaller scale, and it is just this similarity that makes

Tuna my ideal runabout. The fuller lines, higher sheer and wider flare are the factors which will count when out at Block Island. The tunnel stern, after sections and shallow draft are the points that will be appreciated when running in the shallow harbors and out of the regular channels used by craft of greater draft.

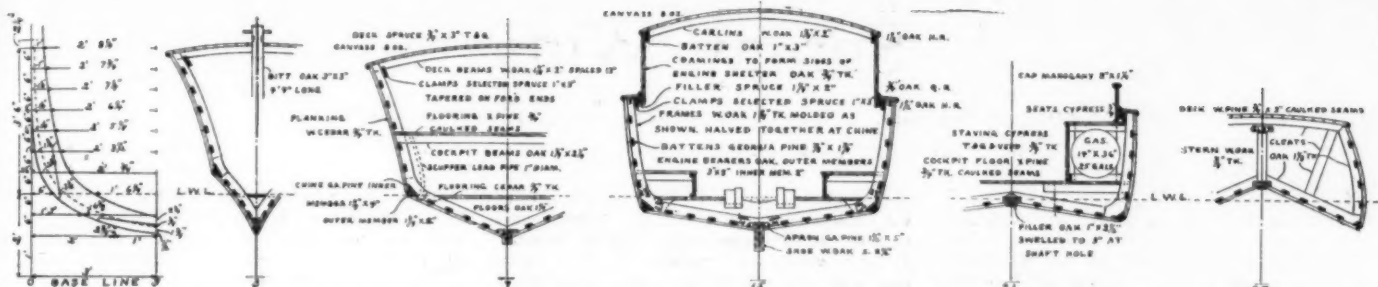
Runabout "Tuna"		OFFSETS										27' x 6' 8" x 18"		
Stations		0	3	6	9	12	15	18	21	24	27			
Heights	Sheer	5. 6.0	5. 4.6	5. 3.2	5. 1.6	5. 0.2	4. 4.6	4. 3.2	4. 1.6	4. 0.2	3.11.0			
	Chine	2. 9.0	2. 5.6	2. 2.4	2. 0.0	1. 9.6	1. 8.0	1. 6.6	1. 6.0	1. 5.0	1. 4.0			
	Rabbit	1. 2.2	1. 0.0	1. 0.0	1. 0.0	1. 0.6	1. 2.6	1. 6.0	1.10.4	2. 1.6	2. 4.0			
	Keel	1. 0.4	1.10.6					Straight				0. 6.0		
Half Breadths	Sheer		2. 1.6	3. 1.0	3. 4.2	3. 4.2	3. 3.0	3. 1.7	2.11.3	2. 6.6	2. 0.0			
	Chine		1. 0.6	1.10.5	2. 5.2	2. 8.4	2. 9.6	2. 9.1	2. 8.2	2. 6.5	2. 4.4			
	L. W. L.		1. 7.4	1. 5.4	2. 5.2	2. 9.0	2.10.6	2.11.0	2.10.0	2. 8.1	2. 6.0			
	Rabbit		0. 1.2	0. 1.2	0. 1.2	0. 1.2	0. 1.2	0. 1.2	0. 1.2	0. 1.4	0. 1.2	0. 1.2		
Half Breadths	Diag. A.		1. 8.7	2. 7.6	3. 1.2	3. 3.4	3. 4.0	3. 3.0	3. 0.4	2. 9.1	2. 3.1			
	Diag. B.		1. 4.6	2. 3.4	2. 9.6	3. 1.1	3. 2.7	3. 2.4						
	Diag. C.		1. 1.6	2. 0.2	2. 7.0	2.10.6	3. 0.6	3. 0.6	2.11.4	2. 9.6	2. 6.4			
	Diag. D.		0.10.2	1. 6.6							2. 7.3			
	Diag. E.		0. 6.1	0.11.4										
Dimensions Given in Feet, Inches, Eighthths (Outside of Planks)														

Dimensions Given in Feet, Inches, Eighths (Outside of Planks)

Table of offsets for Tuna



Hydroplane racing when the wind blows. The splash when the boats hit a wave adds excitement for the spectators but does not help in making speed records. Out of the five boats there is only one that is not trying for a splash record



Sections showing construction details, sizes and kinds of materials used and offsets for working out the stem and cutting the rabbet. The sections show the seam batten construction used throughout in the hull

CONDITIONS FOR "MY IDEAL RUNABOUT" DESIGNS

The "Ideal Runabouts" described from month to month in MoToR BoatiNG will be only those which have been designed by amateurs—boatmen who know from actual experience what they are talking about. If you are an amateur who has ideas on the subject we should like to publish the plans and descriptions of your ideal runabout or open boat.

For each set of plans which we publish we will pay \$35 in cash. In addition to this, we shall give a prize of \$75 worth of boat equipment of his own selection to the amateur designer whose boat is voted by the body of MoToR BoatiNG's subscribers to be the nearest to their conception of an ideal craft. A poll will be taken after the publi-

cation of the last of the series and every subscriber to MoToR BoatiNG will be given an opportunity to register his preference.

Six or more designs of different runabouts and open boats will be published in successive issues. Each design must be complete in every particular, so that the amateur who knows anything at all of boat building will be able to construct his own craft from the published particulars. The plans must include an outboard profile as well as interior arrangement plans, full set of lines, table of offsets and construction details—in fact, all data necessary for the construction of the boat. The description should be general in trend and should set forth the designer's reasons for con-

sidering his craft the ideal one. The drawings may be to any scale but must be in black ink on white paper or tracing cloth and the description not over 2,500 words in length.

As construction methods are more or less alike, irrespective of design, contributors to the series should not put too much stress on this phase of the subject in the description.

Designs and descriptions of "My Ideal Runabout" may be submitted any time up to May 15, 1918, but we suggest that they be sent in as soon as possible. Those who submit them before the rush, as the end of the contest draws near, stand a better chance of having them published.—Editor.

Regina—A Shallow-Draft Cruiser

A Bridge-Deck Cruiser Designed for Use in the Shallow Waters of Florida—Head-room and Seaworthiness Not Sacrificed for Draft and Speed

THE requirements of a bridge-deck cruiser for use on the waters adjacent to New York where steadiness in a seaway, substantial construction and plenty of power are of primary importance and at the same time produce a shallow-draft boat for use in Florida were successfully met in Regina, designed by W. J. Deed, of Boston, Mass., and built by the Valley Boat Co., of Saginaw, Mich., for E. H. Lyon, of New York, N. Y.

Regina is 36 feet long, with a beam of 10 feet and a draft of 2 feet. She is heavily built throughout, having an oak frame, long-leaf yellow pine planking below the waterline and Michigan white pine above and all joiner work of mahogany.

The power plant is an all-enclosed four-cylinder 20-27 h.p. series B, medium-duty Scripps motor installed under the bridge deck. The motor is equipped with an electric starting and lighting outfit, and all controls are brought to the deck within con-

venient distance of the steering wheel, making it in every respect a one-man boat.

By using an all-enclosed motor Mr. Lyon is

assured a quiet power plant and at all times a clean engine compartment and a bilge free from oil. This materially reduces the fire hazard and does away with the smell of oily bilge water which is always associated with some boats.

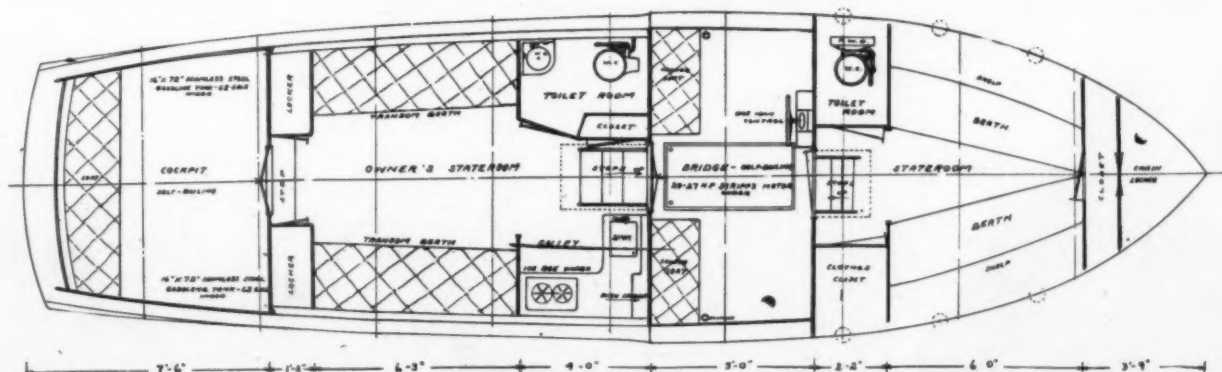
Regina has rather fine lines for a boat of her dimensions with a very pronounced flare forward. The underbody is rather full forward with flat after sections allowing the draft to be kept within the 2-foot limit. The full draft is carried some distance forward so that the boat would be seaworthy and easily handled in rough water.

The general arrangement is a chain locker forward followed by a cabin with two berths, lavatory, hanging clothes closet and cabinet all under the raised deck and reached from the bridge by a companionway. Next aft is the bridge deck with built-in seats and plenty of room for chairs and a hatch over the motor.

Regina makes a most attractive appearance and is thoroughly seaworthy.



Drawing only 2 feet of water, Regina is able to run close to shore and in many places can dock against the bank



Arrangement plan of Regina showing how completely every bit of space has been put to some useful purpose. This boat is fully entitled to be called a cruiser as it embodies every necessity for enjoying life afloat

Sunray Wins

The Choice of the Ideal Cruiser Competition Decided After a Month of Spirited Voting by the Subscribers of MoToR Boating

SUNRAY, the design submitted by F. T. Lander, of New York City, published in the February 1917 issue of MoToR BOATING has been chosen by our subscribers as "Their Ideal Cruiser". MoToR BOATING heartily approves of the selection and had we been allowed a vote, or to make the decision ourselves, we believe we would have been tempted to vote likewise.

Second choice was

ever published, that any of the designs printed were worthy of first choice and "Please give us more of the same thing." Many sending in votes wrote their reasons for their choice and some very interesting and constructive criticisms were received.

As may be remembered Sunray is a 36-foot double-cabin cruiser with a beam of 10 feet. She is powered with a four-cylinder Dorman motor, having a bore and stroke of 5x6 inches, developing from 24 to 30 h.p. and giving Sunray a speed of about 9 miles per hour. The motor is equipped with self-starter and a complete lighting outfit.

The power plant is located beneath the cockpit floor.

The owner's quarters are in the after cabin, and the galley, toilet, and sleeping accommodations for a crew of two are located forward.

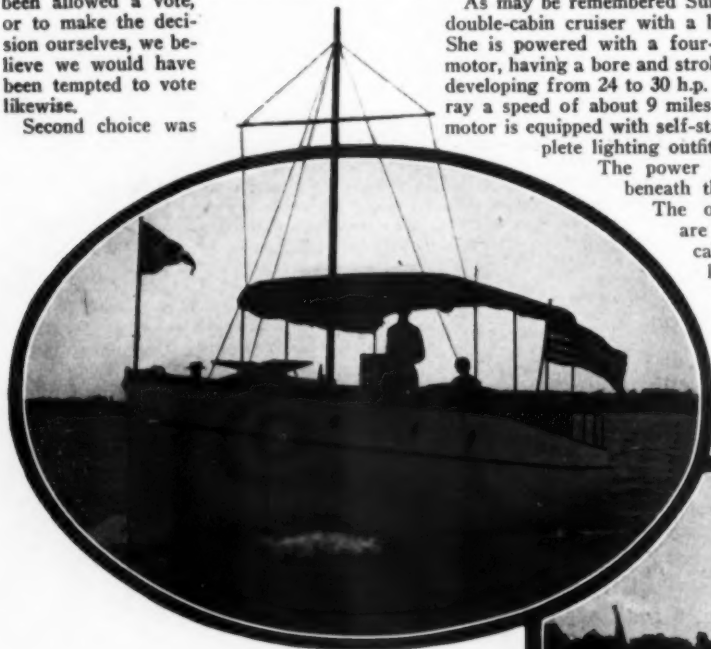
To our

many friends who submitted designs and who have expressed their approval of our efforts, we express our thanks. We regret that space did not permit us to publish every design sent us.

The "Ideal Runabout" series, the first design of which appears in this number, is already attracting much attention and favorable comment. The indications are that the new series will prove every bit as popular as the "Ideal Cruiser" competition if not more so. Several very excellent designs have been received but we have room for many more.

As in the "Ideal Cruiser" series, the designs are restricted to those devised by amateurs—motor boatmen who have played the game and know whereof they speak—men who have sailed runabouts or open boats and are familiar with the conditions to be met.

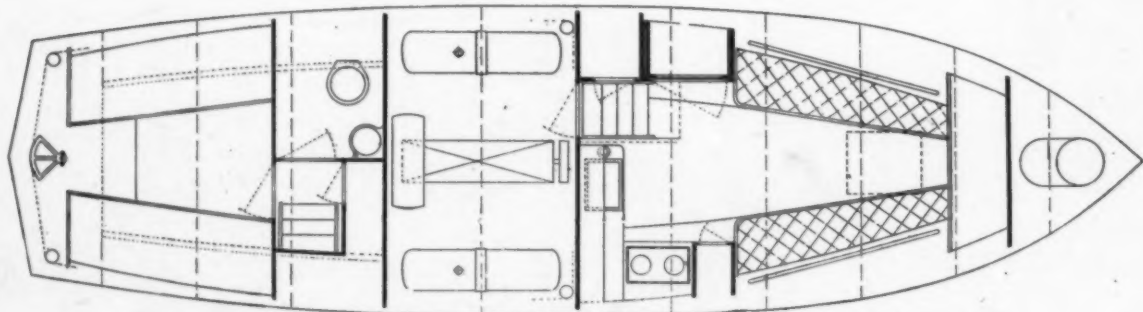
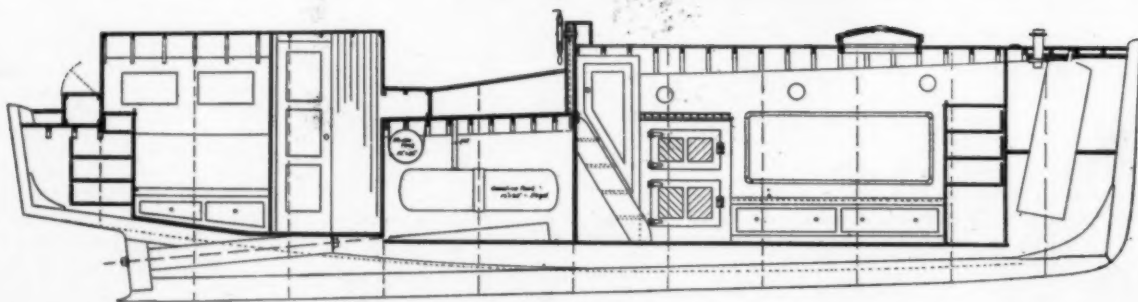
Let every amateur who has any good ideas on what his "Ideal Runabout" should be submit his plans and description, not only in the hope of winning the prize, but that any other motor boatmen interested in the same type of boat may profit by his experience. In this way co-operation—the thing most beneficial to any sport—may be obtained by the motor boatman from coast to coast.



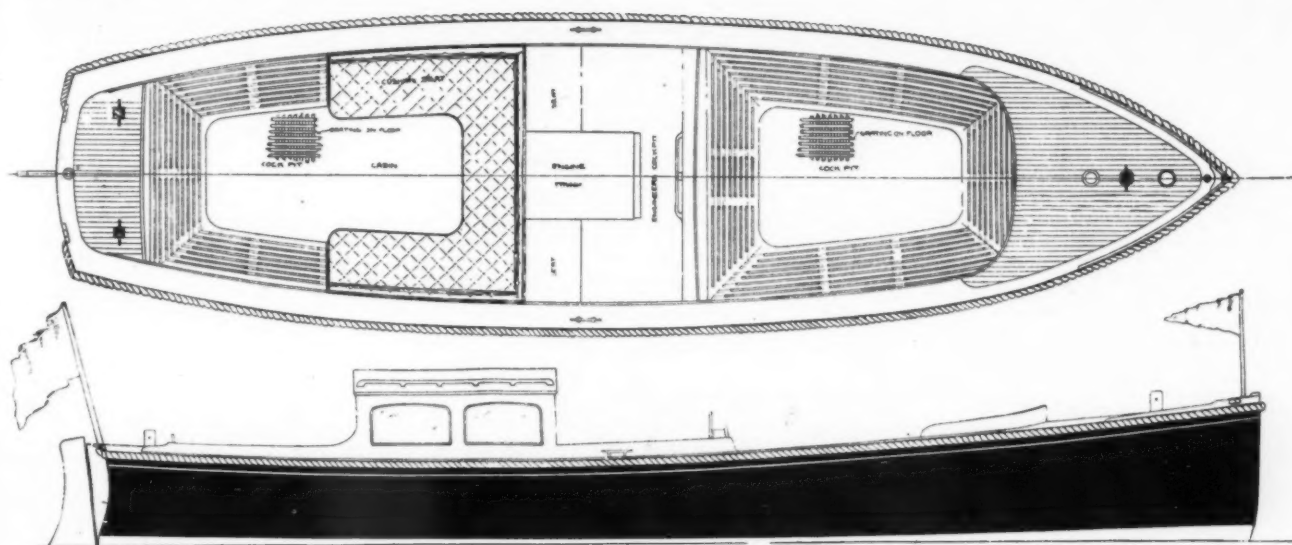
Sunray coming and going

a tie between Cygnet, Ruth and Spook, each of these three boats receiving the same number of votes and were only four votes behind the winner at the finish. So our readers will see how evenly divided public opinion was. There was not a single one of the ten designs which were published in the "Ideal Cruiser" series that failed to receive several votes.

One opinion was unanimous and that was, that the "Ideal Cruiser" series was the best thing of its kind



Interior arrangement plan and inboard profile of Sunray; scale 3/16-inch equals one foot



A Luders tender at the show

Exhibitors at the Motor Boat Show

Albany Boat Corp., Watervliet, N. Y.
Arrow Motor & Machine Co., New York, N. Y.

Banfield Boat Wks., Atlantic Hlds., N. J.
Billings-Chapin Co., Cleveland, O.
Blue & Queripel Co., Inc., New York, N. Y.
Bridgeport Motor Co., Bridgeport, Conn.
Brooklyn Varnish Co., Brooklyn, N. Y.
Bruns, Kimball & Co., New York, N. Y.
Byrne Kingston & Co., Kokomo, Ind.

Cape Cod Power Dory Co., Wareham, Mass.
Carlyle Johnson Machine Co., Manchester, Conn.
Chicago Varnish Co., Chicago, Ill.
Columbian Bronze Corp., Freeport, L. I., N. Y.
Crockett Co., David B., Bridgeport, Conn.

Day, Thos. Fleming, New York, N. Y.
Dayton Engineering Laboratories Co., Dayton, O.

Debevoise Co., Brooklyn, N. Y.
Dodd-William Mfg. Co., New York, N. Y.
Duesenberg Motors Corp., New York, N. Y.
Durkee & Co., Inc., Chas. D., New York, N. Y.

Eastern Motorist, Newark, N. J.
Edison Storage Battery Co., Orange, N. J.
Elco Co., Bayonne, N. J.
Ericsson Mfg. Co., Buffalo, N. Y.
Evans Stamping & Plating Co., Taunton, Mass.
Evinrude Motor Co., Milwaukee, Wis.

Fairbanks, Morse & Co., New York, N. Y.
Fay & Bowen Engine Co., Geneva, N. Y.
Fenner, T. M., New York, N. Y.
Francke Co., New York, N. Y.
Frisbie Motor Co., Middletown, Conn.

In the list below will be found the names and addresses in alphabetical arrangement of the boat, engine, and accessory exhibitors at the National Motor Boat Show, held at the Grand Central Palace, New York City—January 19-26, 1918:

Gas Engine & Power Co. & Chas. L. Seabury & Co., Cons., Morris Heights, N. Y.
Generator Valve Co., Brooklyn, N. Y.
Gielow & Orr, New York, N. Y.
Gillespie & Sons, Chas. H., Jersey City, N. J.
Gray Motor Co., Detroit, Mich.

Higgins & Seiter, Inc., New York, N. Y.
Hyde Windlass Co., Bath, Me.

International Life Suit Corp., New York, N. Y.

Kemp, W. E., New York, N. Y.
Kermath Mfg. Co., Detroit, Mich.
Knock-Down Motors Co., Brooklyn, N. Y.
Kokomo Electric Co., Kokomo, Ind.
Koven & Bro., L. O., Jersey City, N. J.

Leece-Neville Co., The, Cleveland, O.
Luders Marine Construction Co., Stamford, Conn.

McCord Mfg. Co., Detroit, Mich.
Mianus Motor Wks., Stamford, Conn.
Monarch Valve Co., Brooklyn, N. Y.
Moto-Meter Co., Long Island City, N. Y.
MoToR BOATING, New York, N. Y.
Murray & Tregurtha Co., So. Boston, Mass.

Navy Gear Co., New Haven, Conn.
Niagara Motors Corp., Buffalo, N. Y.
North East Electric Co., Rochester, N. Y.

Palmer Bros., Cos Cob, Conn.
Paragon Gear Works, Taunton, Mass.
Peerless Marine Motor Co., Buffalo, N. Y.
Portland Cement Ass'n, New York, N. Y.
Pyrene Mfg. Co., New York, N. Y.

Red Bank Yacht Wks., Red Bank, N. J.
Regal Gasoline Engine Co., Coldwater, Mich.

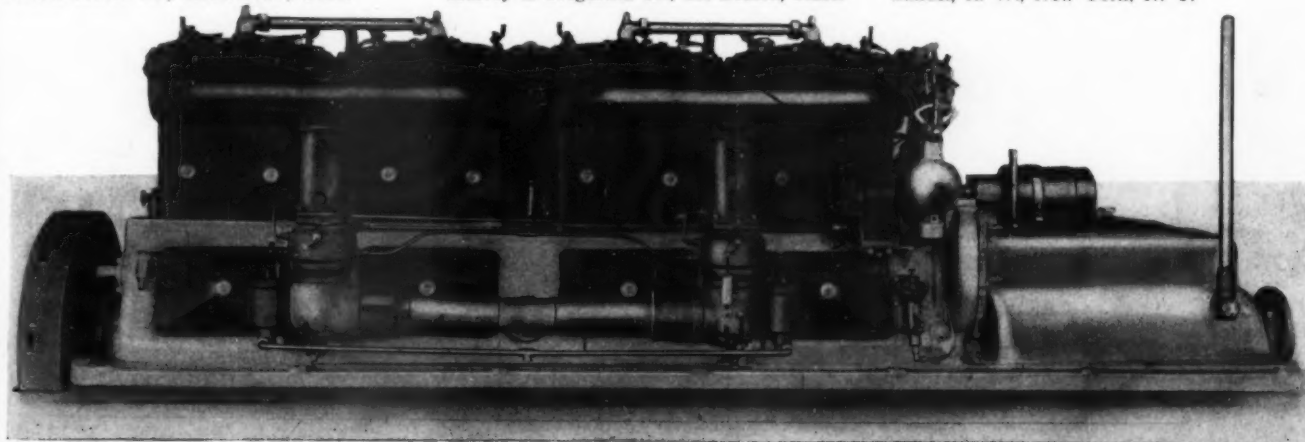
Shallow Water Boat Co., New York, N. Y.
Smith & Co., Edward, Long Island City, N. Y.
Snow & Petrelli Mfg. Co., New Haven, Conn.
Sterling Engine Co., Buffalo, N. Y.
Stromberg Motor Devices Co., Chicago, Ill.
Sumter Electrical Co., New York, N. Y.
Sutter Bros., New York, N. Y.

Tiebout, W. & J., New York, N. Y.
Toppan Boat Mfg. Co., Boston, Mass.

Valentine & Co., New York, N. Y.
Van Blerck Motor Co., Monroe, Mich.
Verrier-Eddy Co., New York, N. Y.

Welin Marine Equipment Co., Long Island City, N. Y.
Wheeler-Schebler Carbureter Co., Indianapolis, Ind.
Willis Co., E. J., New York, N. Y.
Wisconsin Motor Mfg. Co., Milwaukee, Wis.
Woolsey Paint & Color Co., C. A., Jersey City, N. J.

Zundel, R. W., New York, N. Y.



View of the Model F, 300 h.p. Sterling, inlet side, as the motor appears at the show, showing the wonderful development of the high-speed, high-powered marine engine of the day. It is such motors as this that give the cruisers and patrol boats the speed of the express train and torpedo boat destroyers. Vessels powered with single or twin motors of this type attain speeds approximating 30 m.p.h. and are capable of holding that speed for long runs. A notable scout patrol boat, formerly named *Susanne*, now on duty at Newport, made a run this season of 330 miles in 15 hours, without a stop. The day following this run the craft, with no attention to the power plant, was run from Chicago, down the lakes and through the canal and up the coast, to Newport, where she has been in service ever since, performing the various duties attendant these patrol boats. It is illustrative of the remarkable performance of which the modern cruisers are capable.

The 1918 Motor Boat Show a Huge Success

Exhibits and Attendance Fully Up to the Standard—Many New Features in Boat Design, Engine Construction, and Accessories Shown—Motor Boating Activities for the Coming Season Planned

On the following pages will be found a complete account of all the exhibits shown at the National Motor Boat Show held this year at the Grand Central Palace, New York City, from January 19 to 26, inclusive. The descriptions serve as a complete guide to the Show so that those interested motor boatmen who are fortunate enough to be able to attend in person will have a record of what he saw at the Show. Those others so situated that they were unable to come to New York during the Show week may keep themselves informed of the trend of boat and engine building as evidenced

by the new models which were exhibited and are herein described.

We take pride in the fact that MoToR Boating is the only magazine ready for distribution before the Show closes which contains a complete description of all the exhibits. This is following out MoToR Boating's policy to be the first in its field to give its readers first hand information. We have always felt that every motor boatman with red blood in his veins wishes to read about the Big Show while it is actually taking place, therefore, we take pleasure in commending to our readers the following:—Editor.

FOR those interested in electric self-starter and generator units, the North East Electric Co., of Rochester, N. Y., have a most complete exhibit of their one- and two-unit systems. The model G single-unit starter generator is a four-pole machine capable of operating as a motor or as a generator. The normal speed of this unit while acting as a starter is from 350 to 500 r.p.m., the driving ratio most frequently employed is three revolutions of the motor to one of the engine crankshaft, giving a cranking speed from 100 to 175 r.p.m., according to the characteristics of the engine. When acting as a generator the machine begins to deliver current to the battery at engine speeds as low as 350 to 400 r.p.m.

In the two-unit system the starting motor is a four-pole series wound machine capable of delivering over 1 h.p. at the rated voltage. It is able to crank the average marine engine at a speed from 100 to 200 r.p.m., according to the drive ratio employed. The generator for this system can be driven from the pump shaft or by gears or chain drive from the crankshaft. This generator delivers current to the battery at engine speeds as low as 400 or 500 r.p.m. and has a maximum charging rate of 17 amperes.

The complete system includes a very substantially built starting switch and an automatic cut-out to prevent the batteries discharging back through the generator.

The L. W. Lathrop Co., of Mystic, Conn., have three of their single-cylinder two-cycle motors developing from 3 to 7 h.p. and a 10 h.p. two-cylinder two-cycle motor of their usual design and four of their recently developed four-cycle two, three, and four-cylinder motors developing from 12 to 28 h.p.

The 10 h.p. two-cycle machine and the four-cycle motors are complete with high-tension Bosch magnetos, mechanical oilers and integral reverse gears.

Large panels showing the various finishes to be obtained by the use of Monarch spar varnish, Monarch cabin finish, Monarch floor finish and Monarch white enamel are the principal features in the display of Charles H. Gillespie & Sons, of New York, N. Y. They are also demonstrating the use of their Bull Dog paint and varnish remover and answering many questions in regard to its use in marine work.

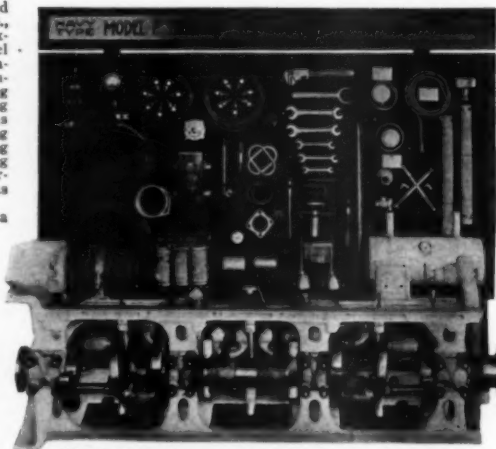
The Fay & Bowen Engine Co., of Geneva, N. Y., have three interesting runabouts in their space. The one which attracts the most attention is a 32 by 6-foot craft from designs by Crouch, which is cedar-planked with selected mahogany finish. The boat is complete in every respect. The equipment includes an automobile-type extension top, electric lights, special upholstery and every luxury which can be incorporated in a boat of this size. The power plant located under the hatches forward is a six-cylinder, 75 h.p. Fay & Bowen motor with electric starting and lighting equipment which will drive this boat somewhat better than 23 m.p.h.

They also have a 30 by 5½-foot raised-deck runabout from designs by Whitaker. This boat is oak framed, white cedar-planked with full mahogany finish inside and out. The power plant is a 50 h.p. six-cylinder Fay & Bowen motor with electric starting and lighting system and will drive the boat at 20 m.p.h.

The Junior runabout, 24 by 5 feet, for use on more protected waters, which is also from designs by Whitaker, is cypress-planked with mahogany trim. The power plant in this boat is also a Fay & Bowen motor developing 17 h.p., which will give it a speed of 15 m.p.h.

This company is also exhibiting a full line of their four-cycle engines, two-cycle engines and electric lighting set.

Space 17 is occupied by the C. A. Woolsey Paint and Color Co., of Jersey City, N. J. Their exhibit consists principally of panels showing the various finishes to be obtained with their



Model F Sterling motor tilted over and base removed to show crankshaft. Display case of parts for this engine is shown behind the motor

marine paints and varnishes, and their well-known copper anti-fouling bottom paint. P. A. Varley is in charge with several assistants, who are only too glad to give advice on the use of and answer questions relating to paints for marine purposes. Color cards and descriptive literature may be had for the asking.

The Bridgeport Motor Co., Inc., Bridgeport, Conn., have quite a motor show of their own in block E. It consists of eight two-cycle motors in one and two-cylinder models developing from 4½ to 22 h.p., and three heavy-duty four-cycle, three- and four-cylinder motors rated at 24, 36 and 50 h.p. These motors can be equipped for using kerosene by the addition of a double carburetor to provide for starting on gasoline and running until warmed up. By means of a special heating apparatus and manifold these engines are as flexible and free from trouble when operating on kerosene as when gasoline is used.

Space 20 is occupied by the Debevoise Co., of Brooklyn, N. Y., where they are showing panels finished in De-Pa-Co marine flat white, De-Pa-Co

scout cruiser gray and their Fulton brand of copper paint. In one of the naval districts practically every yacht converted to scout patrol service for the Government was painted with De-Pa-Co scout cruiser gray. The display is in charge of Captain J. F. Winans, Captain Frank Day, F. W. Tibben, T. C. Wiswall and A. M. Mitchell.

One of the most attractive exhibits is that of the Duesenberg Motors Corp., of New York, N. Y., in space H, showing their marine, automobile and aviation motors. There are two eight-cylinder marine motors of the latest type, one opened and tilted back to show the crankshaft and valve action, two six-cylinder patrol motor marine motors of the most modern design—duplicates of the motors now in use in many of the fastest sectional patrol boats on scout and patrol duty along our coast.

One of the sixteen-valve racing automobile motors is shown with the cover plates removed to illustrate the rocker arm valve action. This is a duplicate of the motor which is used in more than 60 per cent of the cars that have raced on the tracks and speedways of America during the past year. There is also one of the new Model G motors, the latest development of the Duesenberg design as applied to automobile engines.

One of the most interesting features is the Model A geared drive aeronautical motor. They are also showing a Model A direct drive and a twelve-cylinder Duesenberg aviation engine together with a number of disassembled parts of these motors. The exhibit is in charge of N. G. Rost, general sales manager of the Duesenberg Motors Corp., assisted by G. W. Brogan and Lorimer Dunlevi.

The Albany Boat Corp., of Watervliet, N. Y., have been so busy on Government and private work that they were unable to complete a boat for the show. They have, however, a number of models and drawings and many photographs of their boats in space 43.

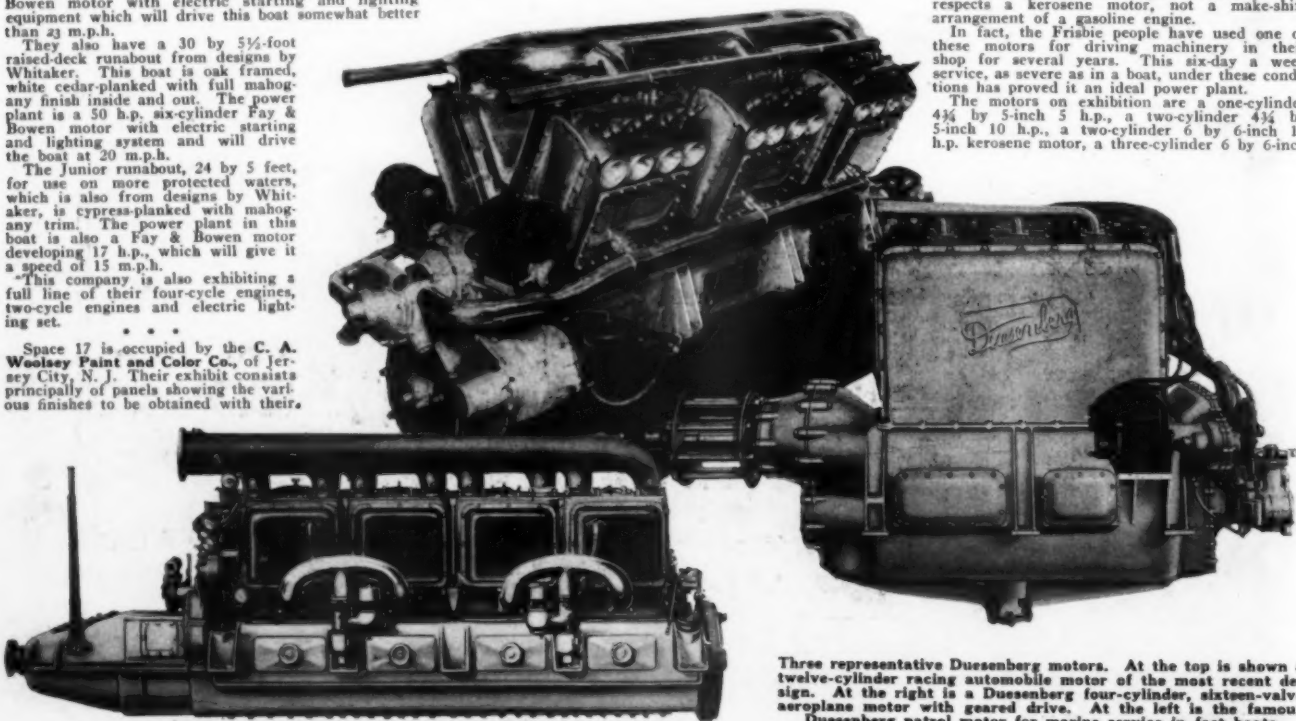
One of the new designs just brought out by this company in their runabouts of standard design is one with the motor installed at the stern. This is an entirely new departure in runabouts and they claim has many advantages over the older scheme of installing the motor just forward of amidships.

The Albany Boat Corp. is prepared to build high-speed cruisers or runabouts—boats of standard design—that are complete in every detail and will make the speed guaranteed and better.

The Frisbie Motor Co., of Middletown, Conn., have on exhibition seven of their motors, one, two, three, four, and six-cylinder models developing from 5 to 75 h.p. By far the most interesting feature is the two-cylinder 16 h.p. kerosene motor. This engine is started on gasoline and as soon as it is warm is run on kerosene. It is provided with both a gasoline and a kerosene carburetor, on opposite sides, and a heater for the kerosene vapor. This is in all respects a kerosene motor, not a make-shift arrangement of a gasoline engine.

In fact, the Frisbie people have used one of these motors for driving machinery in their shop for several years. This six-day a week service, as severe as in a boat, under these conditions has proved it an ideal power plant.

The motors on exhibition are a one-cylinder 4½ by 5-inch 5 h.p., a two-cylinder 4¾ by 5-inch 10 h.p., a two-cylinder 6 by 6-inch 16 h.p. kerosene motor, a three-cylinder 6 by 6-inch



Three representative Duesenberg motors. At the top is shown a twelve-cylinder racing automobile motor of the most recent design. At the right is a Duesenberg four-cylinder, sixteen-valve aeroplane motor with geared drive. At the left is the famous Duesenberg patrol motor for marine service in fast boats

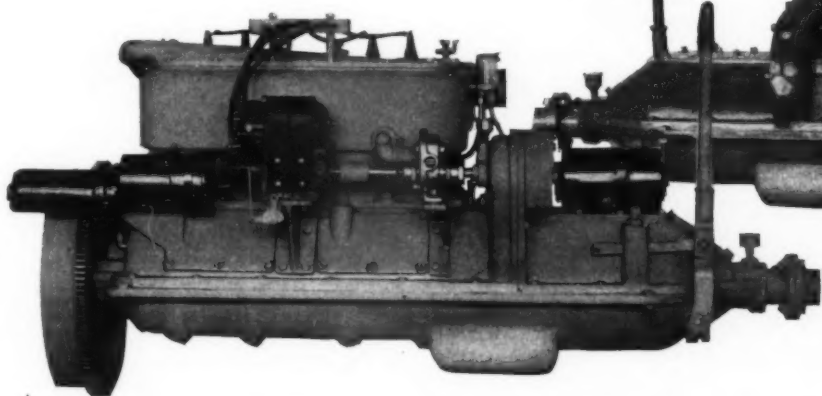
25 h.p., a four-cylinder 4 1/2 by 5-inch 30 h.p., a four-cylinder 6 by 6-inch 40 h.p., and a six-cylinder 6 by 6-inch 75 h.p. motor.

The six-cylinder motor is the latest member of the Frisbie family and embodies all the good points found in the smaller sizes. It is equipped with mechanical oiler, high-tension magneto and air heater. All models brought out by this company are of the well-known Frisbie valve-in-head type which they have been building for over ten years.

Owing to the amount of Government work in their

being successfully transmitted by these couplings. They are made in sizes suitable for any power and weigh from 8 ounces up to 7 tons each.

The Wisconsin Motor Mfg. Co., of Milwaukee, Wis.,



Two models of the Kermath motor. Above, the new rear-starter requiring no brackets. To the left is shown a Kermath motor with two-unit starting and lighting equipment and high-tension magneto

shops the Luders Marine Construction Co., of Stamford, Conn., were unable to have a new boat ready for the show. They have, however, a most interesting club tender in their space. This boat was presented to the Stamford Yacht Club by Mr. Wyeth for service at their anchorage. It is 32 feet long, 8 feet wide and powered with a 10 h.p. Palmer four-cycle engine. The unique part of the arrangement is a sheltered cabin forward affording ample protection in bad weather. The engine is under a housing amidships, leaving the after part of the cockpit free from obstructions. The boat is finished throughout in teak and the construction is of the highest class.

Bruns, Kimball & Co., of New York, N. Y., have this year a larger display than ever. Besides being the New York agent of the Sterling Engine Co., they are also the representatives of several other engine manufacturers.

In one of their spaces they have the Hartford two-cycle and Gray-Prior four-cycle motors manufactured by the Gray & Prior Machine Co., of Hartford, Conn. The Hartford two-cycle engine has been made and used for so many years that it needs very little description. There is another size to be had this year, a single-cylinder 8 h.p. model. The Hartford is extremely popular with fishermen and the small pleasure boat owner. The Gray-Prior four-cycle engine is a very attractive and well-designed outfit. This motor has a 4 1/2-inch bore and 8-inch stroke. It is equipped with a high-tension magneto and also a battery ignition system, water pump, air pump for whistle and a bilge pump so arranged that in case of emergency it can be connected up and used for circulating water for the engine.

In another space they are showing three sizes of the well-known Kermath engine, manufactured by the Kermath Mfg. Co., of Detroit, Mich. These four-cylinder, four-cycle motors develop, 12, 16 and 20 h.p. each and are in successful operation in many boats.

Bruns, Kimball & Co. will also exhibit this year the Doman line of four-cycle motors, manufactured by the H. C. Doman Co., of Oshkosh, Wis., which may be had in medium speeds and heavy-duty types in sizes from 5 to 85 h.p., in two-, four- and six-cylinder models. There is a new Doman this year, a four-cylinder engine with 4 1/2-inch bore and 6-inch stroke, which is one of the most flexible outfits to be had.

Perhaps the most interesting of all Bruns, Kimball & Co.'s exhibits is that in which the Burnoil heavy-oil engine is shown. The Burnoil is a four-cycle heavy-oil engine that has all the advantages of the Diesel type without the extreme complications of that motor and does not require such high cylinder compression. This motor is manufactured in one-, two-, three-, four- and six-cylinder sizes, all models having a bore of 6 1/2 inches and a stroke of 9 inches.

The well-known Francke flexible coupling is being demonstrated in space 48 by the Smith Sorrell Co., Inc., West St. Bldg., New York, N. Y. They are showing a complete line of flexible couplings—marine type—also sectional models showing how this couplet operates to eliminate misalignment friction between the engine or reverse gear shaft and the propeller shaft.

For those interested in direct-connected generators or other machinery they also have photographs, models and complete specifications of heavy-pattern Francke flexible couplings. There is now more than a million and a quarter horsepower in hundreds of installations

have in their space ten of their well-known Wisconsin Consistent motors. Seven are of the usual type manufactured by this company in four- and six-cylinder models which develop from 18 to 57 h.p., and three are high-speed motors for fast boats and racing purposes, also in four- and six-cylinder models which develop from 100 to 160 h.p.

An actual Wisconsin Consistent runabout installation is shown in Miss Consistency II. This runabout, 28 feet long, 5 feet 8 inches beam and 2 feet draft, was designed by T. M. Fenner and built by Hubert S. Johnson of Bay Head, N. J. The construction of this runabout is of the highest grade throughout. The frame is of oak, the planking and all joiner work is selected mahogany and all hardware and fittings are nickel-plated. The forward seats are of the usual divided design with a passageway between and are upholstered in leather as is also the seat across the after end of the cockpit.

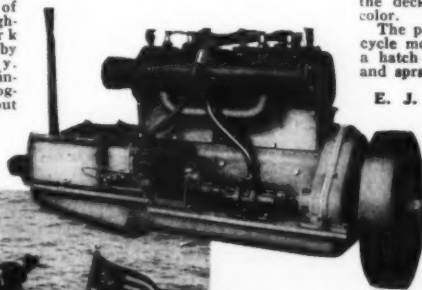
The power plant is a six-cylinder 5 1/10 by 5 1/2-inch Wisconsin Consistent motor which is equipped with Leece-Neville starting and lighting system and turns a Columbian architect's 18 by 27-inch propeller 1,500 r.p.m. Miss Consistency II is built for comfort and to withstand any rough weather. Some idea of the substantial construction is gained when it is said that the hull without power plant weighs 2,200 pounds. With this heavy construction this runabout attained a speed of 30 m.p.h.

Gas Engine & Power Co. and Chas. L. Seabury & Co., Cons., of Morris Heights, N. Y., have a very interesting feature in the way of a 40-foot fishing boat capable of running at express-cruiser speed and with attractive accommodations for four persons in the trunk cabin forward. This boat is equipped with a large wardrobe, complete galley and a rather unique arrangement for sleeping a crew of one man. There is a bridge deck just after the cabin from which the boat can be operated entirely by one man.

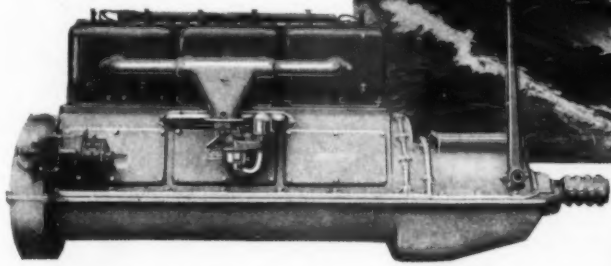
Directly beneath the bridge and accessible through a large hatch in the deck and also through a locker at the after end of the cabin is a Model M Speedway six-cylinder motor, complete with an electric starting and lighting system.

Following the bridge is a large cockpit arranged for wicker chairs and with a large lazy-back seat at the after end. The gasoline tanks are located beneath the cockpit and have a capacity of 125 gallons. This boat is not only serviceable as a fishing boat but is adapted in every way to pleasure cruising.

This company has also on exhibition a 32-foot Speedway runabout with a guaranteed speed of 22 m.p.h. The finish and equipment is of the usual high-class work turned out by this company. The boat is finished in mahogany throughout



Three Speedway products. At the top is shown a Model K motor specially adapted to most runabouts and yacht tenders. In the center is shown a fast yacht tender, a typical



Speedway product. At the left is shown a Model M Speedway motor for medium-duty work

and is built for constant hard service and shows careful thought in working out all the details for the owner and guests. The power plant is a six-cylinder Model M Speedway motor with electric starting and lighting outfit.

Another interesting boat is a 25-foot yacht tender, an excellent sea boat, dry and smooth running. It is lap-strake construction, oak frame, cedar planking and mahogany trim and finished bright throughout. The power plant is a four-cylinder, 4 by 4 1/2-inch Speedway motor which drives the boat about 15 m.p.h. The arrangement is similar to a runabout. The motor is forward under hatches after which is the cockpit fitted with side and cross seats to accommodate eight or ten passengers.

There is also a 16-foot yacht tender similar in finish to the larger one and is a model that has been in great demand by owners of the smaller yachts. The Speedway motors are represented by the four most popular models: the Model K, 4 by 4-inch four-cylinder motor developing 28 h.p. at 1,400 r.p.m., suitable for runabouts and yacht tenders; the Model Z, 4 1/2 by 5 1/2-inch four-cylinder 35-44 h.p. and six-cylinder 50-60 h.p. high-speed motor for runabouts and speed boats; the Model M, 5 1/2 by 7-inch four-cylinder 48-90 h.p., six-cylinder 75-100 h.p., and eight-cylinder 100-200 h.p. motors designed to operate at speeds from 600 to 1,200 r.p.m., and the Model L, 6 1/2 by 8 1/2-inch, medium-duty six-cylinder motor developing 80-115 h.p. at from 400 to 600 r.p.m.

Another interesting feature is the Speedway denatured alcohol stove which may be had in all sizes from a single-burner to an elaborate full-sized stove on which any kind of cooking can be done.

R. W. Zundel, of New York, N. Y., have in their space a complete line of galvanized and brass hardware, including also such accessories as the well-known Perflex ignition system, Hendricks generators, magnetos and lighting outfits, Nobind stuffing boxes and self-aligning struts, Sands toilets and lavatories, Maxim silencers and a variety of kerosene and alcohol stoves for marine use.

The usual display of the Toppan Mfg. Co., of Boston, Mass., has this year been reduced to one of the new 22 by 6-foot postcard model dorries built from specifications of the standardized boat which the United States Coast Guard recently put out.

This boat is pine planked lap-strake construction with the new model narrow bottom which is only a little over 7 inches wide and so designed that it will not pound in rough water. The depth of this boat amidships is 2 feet 6 inches, at the bow 3 feet 6 inches, and at the stern 2 feet 10 inches. The stem transom and frames are of oak. The planking is 3/4-inch selected clear white pine and of the famous lap construction which has proven such a wonderful boat in the roughest of waters and is an improvement over the well-known Swampscott dory. All trim except the decks is of quartered-oak finished in natural color.

The power plant, a Universal four-cylinder four-cycle motor with built-in clutch, is installed under a hatch aft where it is well protected from rain and spray.

E. J. Willis Co., of New York, N. Y., are showing their usual line of marine hardware and engine accessories in their same old place, booths 87-89. Their display of Wilco electric lighting specialties and switch boards is of special interest to boat owners who desire the latest and most compact lighting fixtures, switch boards and electrical equipment.

They also have a full line of the coils and ignition specialties manufactured by the New York Coil Co., Hendricks magnetos, generators and lighting systems, Master's boat meters, Gies reverse gears, A. E. Lovetts Co.'s oil stoves and ranges, Bryant & Berry's propellers and Yankee mufflers. Frank O. Young, manager of the marine department, is in charge.

The Chicago Varnish Co. are occupying space 35 as in previous years and are showing hot and cold water tests of their Navalite marine varnish, a number of boat models showing the finishes to be obtained with their products and their well-known Supreme yacht white, Flo-White and Battleship gray. The exhibition is in charge of Captain Theo. Meyer, who is glad to give advice on the use of their products and the general subject of boat painting.

The McCord Mfg. Co., of Detroit, Mich., have in their exhibition a number of their well-known marine type of force feed lubricators such as are used on the Speedway, Standard and other high-gravity motors. These lubricators are made for either reciprocating or belt-drive, can be adjusted to deliver any amount of oil, have no springs in their mechanism and are of

brass throughout, which will be appreciated by boatmen on the coast. The adjustment of the oil feed is made from the outside, which obviates the necessity of taking down the oiler every time you wish to change the feed.

The Hyde Windlass Co., of Bath, Me., have on exhibition in space 45 a full line of their famous Hyde turbine-type propellers, No-weed propellers and the latest addition to their well-known products, the Gale propeller. The most interesting feature is undoubtedly a duplicate of the propeller used by the Gold Cup winner, Miss Detroit II, at Minneapolis, last summer.

With the present interest in ship-building and the use of auxiliaries for coastwise trade the display of the Fairbanks, Morse & Co., of New York, N. Y., is proving very attractive to the public. It consists of one of their type C-O 100 h.p. heavy-duty marine oil engines of the latest type complete with all its auxiliaries, a type Y horizontal oil engine fire-pump and all the other mechanical devices which are usually installed in an auxiliary schooner.

The Mianus Motor Works, of Stamford, Conn., have on exhibition nine of their two-cycle motors of from 3 to 20 h.p. in one and two-cylinder models, and two four-cycle motors, a 16 h.p. two-cylinder and a 32 h.p. four-cylinder engine of the medium heavy-duty type, also an 8 h.p. four-cycle single-cylinder stationary motor for use on schooners and other vessels. The most attractive feature is a modern life-boat motor completely equipped and with a Mianus life-boat motor installed. N. A. Holstrom, of the New York branch, is in charge, assisted by members of the sales staff.

The Kermath Mfg. Co., of Detroit, Mich., have in their exhibit all three sizes of their unit power plant. The 20-25 h.p. unit is equipped with the new Wagner Electric Co.'s two-unit electric starting and lighting system, using silent chain drive for the generator and the Bendix spur gear drive on the starter. The 10-12 and 16-18 h.p. motors are equipped with entirely new design of rear starter. This device is mounted directly on the motor itself, using no supporting bracket at any point outside of the engine.

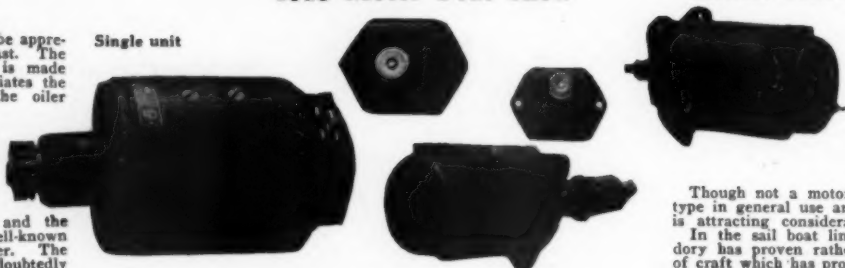
For the first time the Pyrene Mfg. Co., of New York, N. Y., have on display a full line of their Pyrene hand fire extinguishers in the ten styles of finish in which they may be obtained. They also have a hand-drawn chemical engine using the same liquid as the well-known hand extinguisher, a 2½-gallon chemical extinguisher, safety-first aid kits, various sizes of fire hose and nozzles, safety cans for oily waste, non-explosive oil cans and a large number of hooks, axes and other fire-fighting appliances.

An attractive 32-foot mahogany runabout from designs by John Hacker, of Detroit, Mich., and built as a stock model by the Red Bank Yacht Works, Red Bank, N. J., is the central feature of their display. This craft is equipped with a six-cylinder type KRM high-speed 150 h.p. Wisconsin Consistent motor with full electrical equipment. This boat has a carrying capacity of six passengers and even when fully loaded will develop a speed of 37 m.p.h.

They also have a complete motor ice-sled equipped for two passengers and driven by a 10 h.p. four-cycle two-cylinder aviation motor operating a 4-foot diameter by 4-foot pitch aeroplane propeller at 800 r.p.m., giving the sled a speed of 50 m.p.h.

The well-known Seaman patent steering gears, for which the Red Bank Yacht Works are distributors,

Single unit



North East Electric Co.'s single- and double-unit starting and generating sets and two types of starting switches

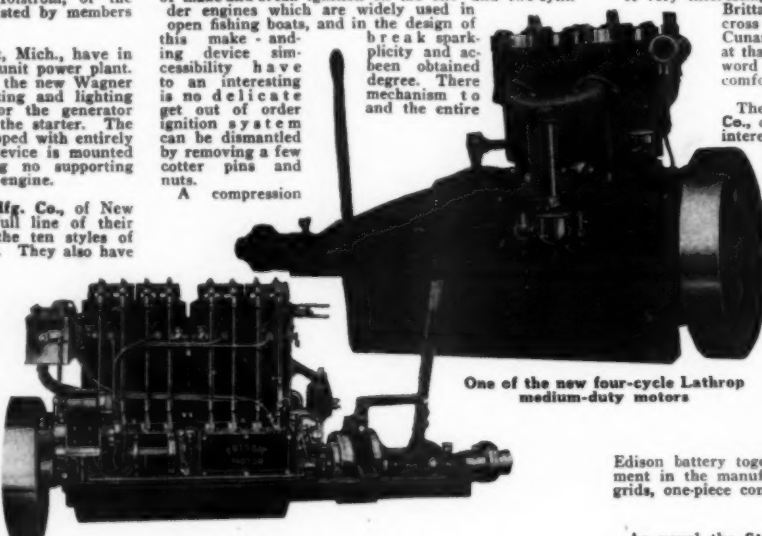
are represented at the show by a 24-inch, 30-inch and a 42-inch wheel and gear. The latter size is the one in use on the British M. L.'s and on the new United States 110-footers.

The Columbian Bronze Corp., of Freeport, L. I., have on display in their section a pyramid of black velvet trimmed with bronze on which are mounted samples of the different types and sizes of Columbian propellers, also their balanced rudders for speed boats, outboard rudders, propeller balancing devices and other accessories.

The Regal Gasoline Engine Co., of Coldwater, Mich., have a characteristic line of their motors on exhibit comprised of eight engines in one, two- and four-cylinder models developing from 2 to 30 h.p.

One of the features in this exhibit is a new type of make-and-break ignition on the one- and two-cylinder engines which are widely used in open fishing boats, and in the design of this make-and-break device simplicity and accessibility have to an interesting degree. There mechanism to get out of order ignition system can be dismantled by removing a few cotter pins and nuts.

A compression



One of the new four-cycle Lathrop medium-duty motors

A typical Frishie valve-in-head four-cylinder motor with Paragon reverse gear

release is also installed upon all of the engines except the smallest one, which is a new feature upon Regal engines and a most desirable one. A sliding finger or pawl operated by an accessible lever upon the starboard side of the crankcase is moved into such a position as to hold the push rod up at the particular point where release of the compression is desired. A most interesting feature, even if it is the smallest in the Regal exhibit, is the new 2 h.p. single-cylinder engine. This is one of the very few four-cycle motors in such small power on the American market. The majority of small engines are of the two-cycle type, but there is a large demand for such small engines in the four-cycle model for use in open launches and yacht tenders. A new feature in the manufacture of small engines of this character is the very complete and automatic oiling system. Oil is contained in the base and forced to all the bearings by a small plunger pump driven from the crankshaft, so that every bearing that requires oil is fed directly from this pump and does not depend upon the splash system.

The Carlyle-Johnson Machine Co., of Manchester, Conn., have on display in their space their well-known reverse gear in five sizes, their one way clutch and their two-cylinder, two-cycle, 3 by 3-inch Bud-E marine motor with complete electrical equipment, built-in reverse gear and rear starter. This light-weight marine motor is especially designed for use in canoes and light-weight runabouts.

As usual the Cape Cod Power Dory Co. are showing a large assortment of boats of popular design ranging in size from a 10-foot rowboat to a 20-foot dory launch. One of the interesting features is a nest of the real old-fashioned bank dories, the boat the deep sea fishermen use and one of the most sea-worthy models of small boats ever developed.

A 20-foot dory launch pow-

ered with a 4 h.p. motor is the largest craft in this company's space. This boat is practically the same as was shown last year, in fact, the only difference to be found is in the finish. The motor is located way aft as is the usual dory practice where it is protected from the weather.

Though not a motor boat the life-saving dory, the type in general use around the waters of New York, is attracting considerable attention.

In the sail boat line a 17-foot decked-over sailing dory has proven rather attractive. This is the type of craft which has proven so successful for one-design racing and for use at schools.

They also have a 16-foot shallow-draft fishing boat for use on protected waters. This is an inexpensive little craft and yet has good carrying capacity and fair speed. The power plant is a 2½ h.p. Palmer motor.

For use on protected waters they also have a nest of three flat-bottomed skiffs, 10, 12 and 14 feet in length, the larger size being especially designed for use with an outboard motor. These little skiffs are especially useful for a boat that is to be beached, for the youngsters to learn to row in and as a tender for large motor boats.

All the boats exhibited by this company are of standardized construction, by which the purchaser is assured a boat of proven merit, not an experiment.

C. D. Durkee & Co., of New York, N. Y., are showing in their space a most complete line of "hardware for wet places." They have the usual line of cabinet hardware, boat fittings in galvanized iron and brass, special fittings which they are supplying to the Government, and making a special feature as usual of their Dunn Divinhood.

A very interesting feature is a reproduction of the Britannia, the first passenger steamer to cross the Atlantic. This was one of the Cunard Steamship Company's fleet and at that time was considered the very last word in marine construction, speed and comfort for the passengers.

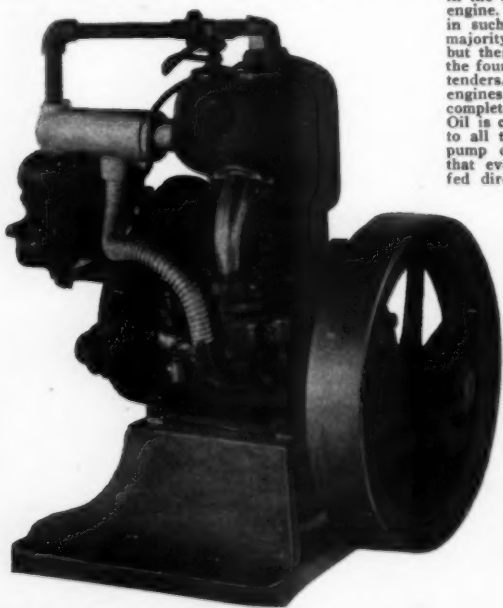
The exhibit of the Billings Chapin Co., of Cleveland, O., has as the most interesting feature display panels showing the effects to be obtained by the use of their U.S.N. deck paint, standard army drab shade and the navy standard war gray. The display is in charge of F. Forbes, local manager of the company; J. Murray Bacon, D. C. Reid and Charles W. Knapp, who will be glad to talk paints with anyone interested.

The Edison Storage Battery Co.'s exhibit consists of their storage batteries of different sizes and capacities, sections showing the interior construction and the various methods of installing the cells. They also have an interesting display board showing in skeleton form the assembly of the element in the manufacture of the steel pockets, tubes, grids, one-piece container, etc.

As usual the Sterling Engine Co., of Buffalo, N. Y., have a large and attractive display of their marine motors in space E. They have nine complete motors and one of the famous Model F disassembled to show the interior construction and a display box of the various parts.

They have their heavy-duty motor in two-, four- and six-cylinder models developing from 12-60 h.p. grouped at one end of the exhibit, with the Sterling Kid, the little four-cylinder 10 h.p. unit power plant beside them as a contrast. This little motor has recently been adopted by the Army for the field wireless outfits. The Sterling Kid was originally developed for use in yacht tenders.

At the other end of the space they have a four-cylinder Model E 17-25 h.p. motor and three Model F motors in six- and eight-cylinder types. These motors are the main feature of the Sterling display and are attracting much attention. The Series F engines



The newest member of the Regal family. A 2 h.p. four-cycle marine motor designed for use in yacht tenders



Aerobled built by the Red Bank Yacht Wks. and driven by an aeroplane motor swinging a 4-foot propeller



Sectional view of a Carlyle Johnson one-way clutch

boat fittings that are designed for real service more than appearances will find this a very interesting feature of the show.

Owing to a great demand for their product and the shortage of stock the Paragon Gear Works, of Taunton, Mass., are showing only two of their well-known marine reverse gears. One is of the yoke-operated type so generally used in unit power plants and the other the slide-operating type which can be attached to any motor.

Even if their exhibit is limited by uncontrollable conditions to two gears, the Paragon Gear Works have two spaces. They have framed enlargements of the battleship pictures they have been using in their advertisements recently and are distributing a reproduction in color of one of them, "The Atlantic Fleet in Battle Line."

Engine manufacturers and others in the trade who do not have exhibits themselves are being made welcome and are using this space as their headquarters.

By far the most interesting paint and varnish exhibit is that of Edward Smith & Co., of Long Island City, N. Y. They have reproduced a varnish chimney, showing how the oil is heated and the gum and turpentine is added in the large copper kettle over a coke fire. Beside the chimney are the supplies of crude gum, oil and turpentine just as in the factory, and the finished product ready for shipment. This is a true reproduction of the method used in manufacturing Smith's spar coating.

They also have panels showing the finish to be obtained with their yacht white, yacht black, marine white enamel, canoe enamels and IXL varnish for interior use. The water-resisting qualities of Aquatite, a varnish for use under water, is being demonstrated by a miniature bell buoy finished with this varnish and floating in a tank of water. The display is in

were developed for Navy service and have been adopted by the Navies of the United States, Russia and Italy. Many of the Model F's incorporate a counterbalanced crankshaft in the series from 25-300 h.p. The Sterling Engine Co. are the only marine motor manufacturers offering motors with this feature with which they obtain increased power, more speed, reduction of vibration to a minimum, and a more even torque than is obtainable with a motor not so balanced.

In addition to their well-known line of cabinet and marine hardware, W. & J. Tiebout, of New York, N. Y., have on exhibition a complete set of the hardware that is being used by the Government on the new boats. Those interested in substantial hardware and

ing of even the largest engines safe, sure and easy. Safe because the starter coupling automatically retards the spark so that the engine cannot come back; sure because the spark produced by the magneto equipped with the starter coupling, is as hot as when the magneto is running at full speed; easy because the coupling makes it unnecessary to crank an engine of any size rapidly.

In addition to the Dixie high-tension models, there is shown a complete and extensive line of Sumter low-tension magnetos, used for make-and-break ignition. The large Sumter "AG" model for instance, probably the largest low-tension magneto made, is used on large heavy-duty marine engines such as those frequently used in submarine chasers and similar boats. The little Imp magnetos which are so extensively used by the hundreds of thousands on farm engines, will also be exhibited. Perhaps the most interesting feature of the low-tension exhibit is the Sumter plugoscillator. While this is not adaptable to marine service, it is used in extremely large quantities on stationary engines and incorporates many unusual and distinctive features.

Of course, the famous Splitdorf Green Jacket spark plugs are shown. The wide reputation of these spark plugs makes it unnecessary to comment on this part of the exhibit, except to say that some unusually interesting spark plugs are shown. For instance, the special airplane type of plug developed for high speed, high compression aeronautical engines and the large special tractor plug which is about twice as big as the ordinary plug usually used in marine and automobile engines.

The Elco Co., of Bayonne, N. J., have in their space three of their standardized boats. The largest, a 36-cruiser, which is six-cylinder Elco



The popular fast fishing boat in the Speedway exhibit which is attracting much attention

velop a speed of 26 m.p.h., also a 32-foot V-bottom express cruiser equipped with the same motor as the larger boat and which will develop a speed of 30 m.p.h.

As in former years they have one of their 32-foot Elco cruisettes the popular two-cabin little cruiser of moderate speed. These boats are powered with a 20-25 h.p. four-cylinder motor. The display is in charge of Thomas S. Hanson.

As usual Palmer Bros., of Cos Cob, Conn., have a little engine show of their own. They have no less than thirty different models and types, representing every style and size built by them. They are of both the two-cycle and four-cycle variety and range from 2 to 120 h.p. in from one to six-cylinder models. The display is in charge of E. E. Palmer, G. E. Geiser and A. Blomgren.

The Murray & Tregurtha Co., of South Boston, Mass., are showing representative models of their heavy-duty motors and have on exhibition for the first time their new high-speed 7 1/2 by 9-inch six-cylinder motor with valves in the head and which develops from 300 to 400 h.p. This motor is specially adapted for express cruisers, patrol boats and Hickman sea sleds, of which they are showing a number of models and photographs.

The Arrow Motor & Machine Co., of New York N. Y., have in their space a number of inboard and detachable marine motors. Their inboard motors, Models K1 and K2, are equipped with copper jacketed cylinders and aluminum base castings which make very light motors, the smaller weighing

only 36 pounds and the larger 60 pounds. They also have the Arrow two-cylinder outboard motor with flywheel magneto and reversing propeller, a Waterman, Porto 3 h.p. outboard motor with the usual copper-jacketed cylinder, flywheel magneto, under water exhaust and independent rudder. In addition to these they have an 18-foot canoe in which has been installed one of the Model K2 motors and a small mahogany tender with a Model K1 motor.

The Peerless Marine Motor Co., of Buffalo, N. Y., have in their space a complete line of Peerless four-cycle marine motors ranging in size from 5 to 50 h.p. This display is in charge of E. L. Grimm and H. Wetherald.

The Niagara Motors Corp., of Buffalo, N. Y., have in their space three of their four-cycle type motors, a Model E-4 four-cylinder 4 1/2 by 6-inch 22-40 h.p.; a Model C-4 four-cylinder 5 1/2 by 7-inch 30-60 h.p., and a Model D-8 eight-cylinder 6 1/2 by 7-inch 80-125 h.p. motor. Sutter Bros., New York representatives, are in charge of the exhibit.

The Monarch Valve Co., of Brooklyn, N. Y., are showing their usual line of carburetors, check valves, auxiliary air valves, stuffing boxes, stern bearings, pumps and fittings, gasoline strainers, generator valves and other auxiliary equipment.

The Brooklyn Varnish Mfg. Co., of Brooklyn, N. Y., have on display in their section panels showing the finishes to be obtained with their Kauri water-proof varnish, marine paints and enamels.

The Generator Valve Co., of Brooklyn, N. Y., have in their display all of the sizes and types of the James-Acorn carburetor, also a complete line of the boat and engine fittings manufactured by this company. The display is in charge of William James.

Galvanized and lead-coated gasoline and air tanks are on display in a great variety of sizes and shapes in the space of L. O. Koven & Bro., of Jersey City, N. J. They also have air-whistle tanks, mufflers, exhaust pipes, yacht stacks and rudders of steel and bronze. The representative in charge is Robert J. Menthe.

Valentine & Co., of New York, N. Y., have their usual exhibition of Valspar varnish for marine use and are demonstrating it with their usual submarine in a tank of water, showing that their varnish will not turn white as most others do. They also have sample panels showing the finishes to be obtained with Kauri enamels and other Valentine products.

Byrne Kingston & Co., and the Kokomo Electric Co., of Kokomo, Ind., are showing a full line of Kings-



One of the features of the C. D. Durkee and Co.'s exhibit, a reproduction of the Britannia, one of the early boats of the Cunard Line

ton carburetors, high-tension magnetos, jump-spark and make-and-break coils, switches, spark plugs and other electrical equipment for marine engines.

Higgins & Seiter, Inc., of New York, N. Y., have their usual display of china and glass ware for use afloat and showing decorative effects they can produce by the use of club flags, private signals and other marine insignia when used on the china.

The David B. Crockett Co., of Bridgeport, Conn., are showing a complete line of Crockett's marine varnish and the finishes to be obtained by the use of them. The display is in charge of A. E. Stranger, G. M. Stebbins and F. L. Farker.

The Stromberg Motor Devices Co., of Chicago, Ill., have about every size and type of carburetors they manufacture and many of them cut showing the interior working. These carburetors are manufactured in every size which could possibly be used on a marine engine.

The Wheeler-Schebler Carburetor Co., of Indianapolis, Ind., have in their space a complete line of carburetors for marine engines whether heavy-duty, medium-duty or high-speed. The main feature of this display is a new type with double air valve which was especially designed for use (Continued on page 62)



A typical Toppan power dory, one of the most seaworthy small boats built

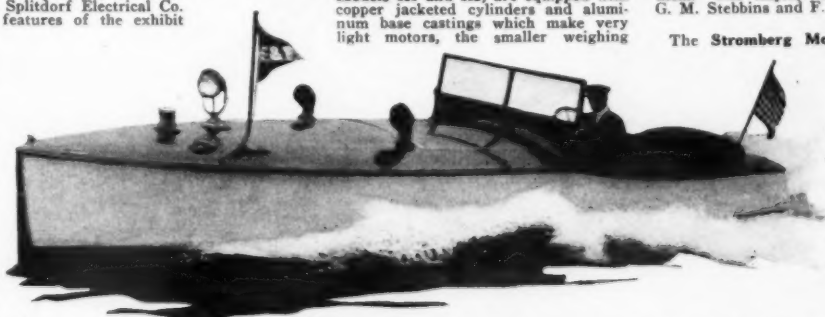
charge of G. A. Rogers and six assistants.

The Gray Motor Co., of Detroit, Mich., have in their space a complete line of the motors manufactured by them. The four-cycle line consists of the Model D, two-cylinder 10-12 h.p. and four-cylinder 20-24 h.p. and the Model F four-cylinder 12-15 h.p. motors, all three being unit power plants with built-in reverse gears. The two-cycle Gray motors are shown in all four sizes in one- and two-cylinder models developing from 3 to 11 h.p.

There has been no radical changes in the Gray motors during the past year. The exhibit is in charge of W. C. Disbrow, the New York representative.

The exhibit of the Splitdorf Electrical Co., of New York, N. Y., will include their own products and those of the Sumter division of the Splitdorf Electrical Co. One of the most interesting features of the exhibit is a Dixie twelve-cylinder model magneto sparking twelve plugs. In addition, other models of the extensive Dixie line are shown and are available for examination.

A great deal of interest is shown in the Sumter starter coupling, a little mechanical device which when attached to the Dixie magneto enables one to start even the largest engines direct from the magneto without any auxiliary battery equipment whatever. Sumter start coupling is attached to various Dixie models and representatives of the Sumter Electrical company are on hand to explain its features which make start-

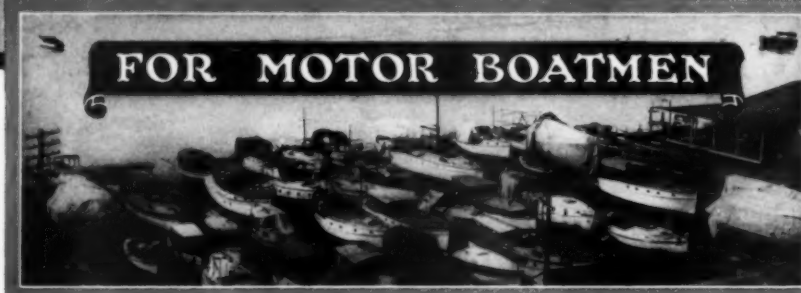


One of the well-known Fay & Bowen runabouts in action. This company builds both the boat and the motor that drives it

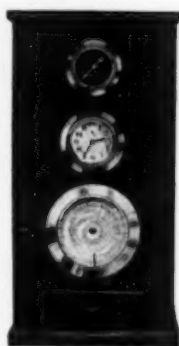
NEW THINGS

FOR MOTOR BOATMEN

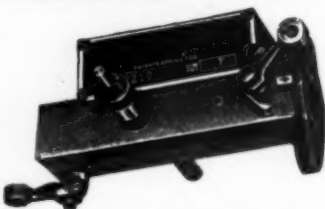
[Each month many new parts, attachments and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descriptions and publish only illustrations with short explanatory captions.



In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the manufacturers' names and addresses. Do not hesitate to ask us, as we have made special arrangements to take care of this branch of our correspondence and are able to give you accurate information with the greatest promptness.]



What speed is the boat making now? What time is it? How fast were we going an hour ago? How far have we gone in the last three hours? These questions are all answered by this marine speed-recording device. The speed that the boat is making is shown on the upper dial, a clock is mounted in the center of the cabinet and at the bottom a permanent record of speed and distance is made on a paper chart which is always visible. The instrument can be installed anywhere on the boat.



This carburetor has a specially designed choking device which is a great aid when starting the motor in cold weather. It is claimed that this carburetor will reduce the gasoline consumption.



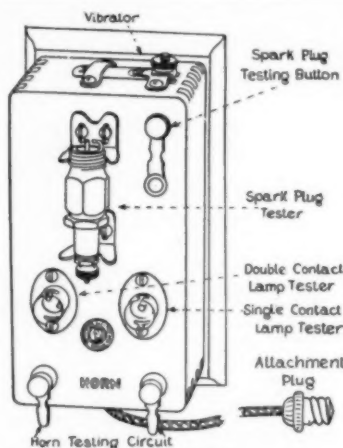
A folding lunch table that is 2 feet wide by 4 feet long when open, and only 6 inches wide, 4 inches deep by 25 inches long when folded. It can be stowed away in a locker or under the deck of even the smallest motor boat.



This curtain fastener is intended for marine work and will hold the curtains in the hardest gale. The grommet is held securely on the spindle by the spring catch. There are no buttons to turn when putting the curtains down in a hurry, a great saving of time. The curtain is released by pressing the catch back with the finger.



A bushing which will protect the spark gap of the plug from oil, assuring a clean plug and a hot spark at all times. The bottom is solid, the gas entering by way of the slots in the sides.



An outfit for testing spark plugs, lamps, horns, and other electrical equipment. It is made to operate on a six-volt battery circuit or an alternating current lighting system.

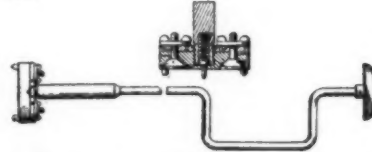


How many motor boatmen can find the true course, magnetic course and compass course without some deep study? Here is a device that will find them for you, and is extremely simple to operate.



Another piston ring to help the compression. This one does it by collecting the oil from the cylinder wall in the groove on the down stroke and distributing it again on the up stroke.

Sailing lights to match the finish of the boat. These electric lamps are made of wood and finished in oak, mahogany or enamel as desired. They are made in the standard sizes for the three classes of boats according to Government regulations. Side lights are made with the screens attached, ready to be installed. Stern lights are made in two patterns, one on a wooden flagpole and the other to be hoisted on a halyard and can be used as an anchor light.



An adjustable valve grinder that can be used in inaccessible places, and assures even grinding as it is held directly over the center of the valve. This tool is specially adapted to large size valves.



There is no excuse for guessing at the condition of the electrolyte in the storage battery. This hydrometer will show the exact strength of the acid, and will not spill it when used. It can be used as a syringe in regulating the height of the liquid in each separate cell.



A spark plug with an air-cooled shell. The flanges radiate much of the heat that is ordinarily absorbed from the shell by the porcelain core. This lessens the liability of cracked porcelains and prevents the plug from sticking so tight to the cylinder when you want to take it out.



Here is something that will be appreciated by every owner of an engine with grease cups. A grease cup with no loose parts to fall into the bilge and no threads to engage. These cups are loaded through the opening in the side. They are made in two patterns, one a grease cup and the other a combination cup and gun.

Do not fail to write to the editor if you desire information concerning any of the above new things



AIR Boating

Air boating has passed the experimental stage. It is both safe and practical. It is a fascinating recreation and an exhilarating sport, well within the means of many of our readers. It will soon be a popular mode of travel. Already it carries some of Europe's mail. Undoubtedly many of our readers, without sacrificing their motor boats, will avail themselves of the pleasure and the freedom of the air.

To herald the development of the science and the industry of the air, as it shall affect the interests of our readers, is the purpose of this department, which will be a regular feature in each issue of MoToR Boating.

What Our Government is Doing for Aviation

AMERICA will take her place in the air. Our pioneer air fighters are now in France. Some are serving over the first line trenches. By the summer of 1918 our air service will contain more trained men than the total number of officers and enlisted men in our army in 1916.

American love of romance and adventure assure a vital and lasting interest in aviation and recent appropriations by Congress of approximately \$700,000,000 have placed our country in its proper air rank among modern nations.

Quietly, unobtrusively, with only now and then a flash of information coming up to the surface, our Government has been building up a great organization of flyers, of machines and of industries to meet the stern demands of war.

Much of this information has of necessity been carefully guarded. Many brave American lives have hung upon such secrecy. The spy notice represents the spirit of Washington in 1918, so far as information is concerned.

However, the outline of what America is doing may be roughly sketched in.

Four years ago our air development lagged behind even third and fourth-rate European powers. To-day many of our material resources are taxed to provide the necessary number of motors and planes. Special courses, called "ground schools," have been established in the best of our universities to provide the preliminary training for officer material.

Men who can meet the physical, mental and moral requirements are comparatively scarce in any land. Men with courage to meet the enemy alone three or four miles above the earth, who possess the necessary judgment and can master reconnaissance, codes, machine gunnery and all the science of the air, represent our highest quality of young manhood. From the volunteers examined naturally only a small percentage are selected.

If a man is accepted into the air service it is the best evidence that he is well above the average development. Too many of the right

Americans trying to keep abreast of military development will be interested in this synopsis of what our Government is doing in cooperation with our allies, to win permanent air supremacy.

Those interested in the after war development of flying, both in this country and abroad, will be glad to know that the vast sums appropriated by Congress assure a permanent air industry.

The American inventions that have led to the conquest of the air, having found their greatest development abroad, are now the basis of an unprecedented military and industrial development here in America.

sort will probably never be obtained.

America, by applying her native genius for organization and standardization, has added to the strength of our allies in the international conflict that impulse which must inevitably give us permanent air supremacy. We have mobilized our industrial resources and re-tooled our factories. Our engineers and skilled mechanics have produced the machine-made Liberty motor, which is now being turned out. They have also set in production the various types of battle, bombing, reconnaissance and training planes necessary to the latest

Never before has such progress been made in any branch of engineering knowledge as that in aerodynamics during the last three years.

Let us realize, however, that this apparent phenomenon was not accomplished without effort and preparation. It has been the patience and perseverance as well as the genius back of the automobile and the motor boat industries that have made the Liberty motor possible. We have been making three-fourths of the world's supply of automobiles and motor boats. We already knew the gasoline engine and that engine is the greater part of the airplane.

It took but a week for our experts to produce the first rough drawings of the Liberty motor. It took less than a month to build the first engine. This was because they had produced other motors before and were experts in their line.

The patriotism of our manufacturers prompted them to relinquish patent rights and to disclose secret processes. This has set our air program months ahead—has perhaps won the war. It has been necessary to produce on short demand a high-quality product in vast quantity, and it is being done. Uncle Sam has been able to reply as fully upon his industries as upon his manhood.

A trip to Washington is the surest way of overcoming any feeling of

uneasiness that one may hold regarding the progress of our aerial development.

Various staffs of scientists are rapidly overtaking the handicap under which the Government started—and profiting by lessons taught in war.

An aviator to go into the air must have a compass to steer by, an altimeter to judge his height, and indicator to show



The student must know his engine inside out before he is ready to acquire practical flying experience

developments known to modern warfare.

The manufacture of planes in a few months has become in volume one of our leading industries. In importance it is easily our first. Probably our largest contribution to the victory of democracy will be our army of aviators and fleets of airplanes. The three years and more of war experience at the disposal of our Government



© Photographs by Com. Pub. Inf.

The task of maintaining an army of aviators and a fleet of airplanes can be better grasped

consider

his speed, a special kind of synchronizing machine gun firing through the propeller, and many other mechanisms as delicate as the most delicate watch. Instruments have had to be made here in thousands which have never before been manufactured in the United States. The intricacies of all these problems, first of scientific development, then of quantity production, can hardly be exaggerated.

The task of maintaining an army of aviators and a fleet of airplanes can be better grasped when we consider that for every man in the air there must be nearly a score of men on the ground.

Any estimation of air strength which does not take into consideration the large number below to support each birdman is inaccurate, and if we keep these facts in mind we will see the actual achievements of our air service to-day in a much truer perspective and will have a much more accurate grasp both of the great history it has already made and of its broad future.

The mechanics, repairmen, airdrome constructors and other men on the ground may be considered the base of a pyramid of which the aviator, perhaps four miles or more in the sky, is the apex.

In a service squadron of 150 men there are only a dozen aviators, and there are other squadrons without a single flyer. Their work consists solely in the construction of fields and the repair of planes.

Our development has been met at every turn with difficulties and shortages almost impossible to foresee. We have had to do our work without cutting off our allies' supplies, either of parts or of raw materials. Enormous demands of four belligerent governments upon the last reservoir of supplies have exhausted even so fundamental an essential as spruce. The linen supply, which comes largely from Ireland, has similarly proved insufficient. It has been necessary to send special ships to East Africa and the Philippines for propeller woods and to India for castor beans to produce the only lubricant able to withstand the new power of the Liberty motor.

Much has been accomplished under the stimulus of wartime needs. The motto has been "The War Will Not Wait." Decisions have been made and action taken immediately, even on the most complex problems, where many weeks of consideration

was desired. Throughout there has been a race against time, a race to get the men and the machines to the front by the time they are needed.

It is hard to realize that our aeronautic

to assemble 30,000 regulars on the Mexican border.

The phenomenal development of the airplane has relegated the older and heavier-than-air craft to second place in modern warfare. The dirigible balloon, however, still has considerable importance as a scout craft.

The bombing operations of the Zeppelin have led many to look upon the dirigible as adapted only for such purposes, when the contrary is true. The dirigible can no more successfully undertake bombing operations without a convoy of warplanes than can a cruiser engage a dreadnaught.

In Germany the Zeppelin is used more and more for scouting than for bombing excursions. Over the North Sea, with a fifty-mile range of vision, it has enabled the German fleet to evade a superior force, or meet a weaker one.

The dirigible can climb much more rapidly in extreme altitudes than the airplane.

Some dirigibles can remain forty hours in the air at an elevation of 13,000 feet while sustaining a cargo of 6,000 pounds, and in that period travel 2,000 miles at an even altitude.

Uncle Sam has, therefore, not entirely overlooked the importance of this heavier than air craft. After peace is restored it is probable the dirigible balloon may afford one means of safe and rapid travel. Some of the dirigibles now in use, or under construction, may be readily modified to carry from fifty to two hundred passengers, or an equivalent in freight or express matter.

It is unfortunate that on a subject of such importance as wartime air activity we are unable to give more definite information — but who will object to a necessary censorship?

There are, however, other phases of Government aid to aeronautics which can be freely discussed and which are, perhaps, equally important in their bearing on the future sport and industry of Air Boating.

The Civil Aerial Transport Committee, with offices in the Munsey Building, Washington, D. C., is already working on plans for the utilization of military airplanes and war-trained aviators after peace is es-

tablished. Congress has authorized the establishment, equipment and maintenance of ten training (Continued on page 43)

BEWARE OF SPIES

Don't Talk About What You Have Done Or Are Going To Do
The Enemy Has Ears Everywhere

DON'T discuss Naval affairs or the movements of ships or their cargoes or courses.

DON'T trust anyone. ENEMY SPIES at home and abroad will try to draw you into arguments and entrap you into telling them about the movements of ships, their cargoes, the courses steered, and the steps taken to defend our ships.

DON'T forget to report at once any person who tries to get information from you or from anyone else in your hearing.

DON'T forget that your want of care may help the enemy, and lead to the loss of American ships and the deaths of their crews.

Secrecy Means Safety

The spy notice represents the spirit of Washington in 1918, so far as information is concerned



A hangar is only another name for an air boat-house. Its construction is simple and its cost is by no means prohibitive

development has been accomplished in the midst of other gigantic military and naval undertakings only two years after Uncle Sam found it difficult

tablished.

Congress has authorized the establishment, equipment and maintenance of ten training (Continued on page 43)



consider that for every man in the air there must be nearly a score of men on the ground

© Photographs by Com. Pub. Inf.

IN January we followed Uncle Sam's prospective birdman through a most searching physical, mental and moral examination and a strenuous course in the Massachusetts Institute of Technology. This is one of the ground training schools for the Navy. Their course has recently been increased to ten weeks. In the ground school the student has mastered the theory of flight and the use of aircraft instruments, and must know his plane and his engine inside out. He is now ready to acquire the practical skill which comes only with experience. This is gained in one of the numerous training stations.

Most of the ground school graduates know nothing of the practical side of the flying game. To them the training station is a revelation. Frequently the beginners must wait their turn for instruction. Perhaps they will be further delayed by inclement weather, and there is time and opportunity by attendance at the hangars and upon the fields or beaches where the machines are being flown to learn the methods generally employed.

Sooner or later each student is assigned to his instructor, who must be a man of experience in the air. Full of wonder he prepares for his first trip. There is perhaps no sensation in his past life so keen as that accompanying the preparation for his first flight.

No two men will describe the sensations of that trip in the same way, but certain general impressions are almost invariably remembered. For instance, there is the deafening roar of the engine and the sense of great speed as the machine covers the ground or water. A sense of freedom from vibration amounts to a feeling of security as the machine lifts into the air. Contrary to the opinion generally held by the uninitiated, one seldom

experiences any dizziness or sense of height as the plane ascends. The landscape changes constantly in perspective, while the machine appears to be stationary.

The student at first goes up with his instructor to familiarize himself with the actual behavior of a plane in the air. With propellers whirling he must "taxi" from the line far enough for the pilot to look to the right and left to see if another plane is ascending, and to the rear to discover if one is landing.

Special helmets with communicating tubes running to the ear muffs are sometimes worn. This enables the instructor to make audible suggestions, regardless of the noise of engine and rush of air.

Nearly all the instruction machines have two seats and duplicate controls. The student during the first flight occupies the front seat while the instructor is in the rear.

Certain simple signals are agreed upon before the ascent; and usually by the time the student has gotten his bearings the instructor has "shaken the controls," which is the signal for the student to take the wheel and, as far as possible, keep the machine in equilibrium in the air. The student labors with the controls and every minute seems to him an hour. About fifteen minutes after the start the instructor again shakes the controls and a landing is made near the hangar.

More time is allowed for the second instruction flight and little by little the student is taught to turn, bank, climb, and land. He learns to handle the machine under any of the conditions he encounters.

The flights at first are short and frequent and the student is ceaselessly watched and subjected to the most exacting discipline, for "taking off" and landing are among the most dangerous lessons he has to learn.

How Uncle Sam's Bi

Practice Makes Perfect
A Few of the Dangers Which the Well-T

By W. J. Archibald

You who have for many months followed the romantic tales of our own aviators' heroic efforts to make their "sa-

A greater familiarity with their training will give you interest in their accomplishments.

Therefore we follow the January article in the "Well-T" this brief description of just how he gains his act-

The errors demonstrated in flight are carefully corrected by his instructor—who points out all incipient bad tendencies and suggests means for their mastery. Later on spiralling and some of the more difficult operations are attempted.

When the instructor feels that the student is capable of handling the machine alone under ordinary conditions, he transfers him to the rear seat, taking the front or observer's seat himself. From this time on the student is left in control under the watchful eye of his instructor. Thus the student's weaknesses become apparent and every error can be promptly corrected.

The amount of instruction required by the average student varies considerably. Some are turned over for "solo work," particularly in land machines, after only two or three hours actual flying. Again some of the best flyers have required as much as thirty hours under instruction.

When it is thought that the student is ready to fly alone, he will probably be tested by another instructor, and if he continues to demonstrate his efficiency he will be permitted to go up for the first "solo hop."

Every possible safety precaution has been taken and during his first flight the student is watched from below with anxious care by the instructor. Ever since he left ground school he has been held back of his skill at every point along the way.

The care with which every detail of flight has been mastered is indicated by the small percentage of accidents, less than a dozen having resulted fatally, although there are thousands of flights daily. From this time on it is more or less a question of learning by experience, some of which is very hard. In a short time he is able to wing his way alone

During his first flight the student is watched from below with anxious care by the instructor



am's Birdmen Learn to Fly

Perfect in the Air as Down Below.
Which the Well-Trained Aviator Must Face.

By W. Archibald

the following romantic adventure of our allies' bird-interest newspaper reports heralding the results of to make a "safe for democracy."

their training will give you a closer sympathy and a keener

quary arising in the "Naval Birdmen in the Making" with how he gains actual experience in the air.

with perfect confidence, and has become so complete a master of his machine that actual flight itself is a simple and safe matter.

The air is full of new sensations. The student never forgets his first flight through and above the clouds. On what would be considered an ordinarily clear day a small strip of black cloud may be seen far up in the sky. At high speed the flier enters it and almost instantly passes from bright sunshine into dark shadow. And there is rain in the cloud which immediately covers the goggles and obscures the vision.

His problem under such conditions is a difficult one. He must keep his balance on three different axes. On the lateral axis his machine may go up or down. On the vertical axis he may change his direction. On the longitudinal axis he may roll from one side to the other. The sense of balance and direction may entirely desert him. The purpose of many of the physical tests has been to secure flyers who can successfully meet just this problem. It is known, however, that many good flyers cannot keep balance. The beginner should immediately go into a glide and come down below to seek more comfortable climate.

Some training machines are equipped with compasses to give directional stability, just as is a boat, but the darkness and moisture of some storm clouds will obscure the compass.

Sit out of balance in a chair and you will realize that your balance is imperfect.

In a machine you may tip up and turn, say to the left, and still feel that you are seated firmly and that the balance is correct, just as you would feel the lateral balance to be correct on a railroad train rounding a curve. Later the pilot may find that he has been doing a left spiral.

Frequently the halo of the sun may be visible through the cloud which obscures the sky. Under such conditions the pilot may so turn that he can see this, and by keeping the sun in a certain place over the machine he can then remain in the cloud indefinitely.

Most cloud effects are wonderful. Clouds are found in strata, sometimes three deep, and the effect above the highest strata is glorious. The aviator flies through a clear sky under a dazzling sun, over a changing sea of gigantic snowy clouds. Through these shifting fleece like billows he catches occasional glimpses of field, forest, lakes or sea and enjoys an exhilarating sense of freedom.

It is possible to go up over 22,000 feet, but for such altitude the carbureter has to be especially set to work under conditions of rarified atmosphere and low oxygen and the propeller blades designed for greater air displacement.

Above 10,000 the climbing speed is constantly reduced. A climbing speed of say a thousand feet a minute close to earth is greatly cut down at 20,000 feet above the sea.

For extreme altitudes oxygen must be provided for breathing purposes. This, however, is unnecessary on the average training machine, which rarely exceeds a height of 10,000 feet.

Even 10,000 feet to some may seem extremely high, but it must be remembered that the greater the height the less the danger of accident. Nearly all of the few fatalities occur close to earth. At a sufficient height engine trouble is not dangerous, for then it is possible to volplane safely to the ground.

The development of skill in flying during the last few months has been phenomenal. Six months ago nearly

everything but straight flying was prohibited in the flying schools. To-day there are very few accidents even in stunt flying and there is no position into which a machine can fall, however unusual, from which an experienced pilot cannot right it and land safely—provided the altitude is sufficient for the maneuvers. A good machine will even right itself and serious accidents are most infrequent. Practically all fatalities occur in military service and are the result of enemy gunfire.

The "air pockets" of a short time ago have now been ascertained to be descending air currents. Air that is turned up is called "bumpy" air. When the plane is hit by an air current from either above or below, the controls jerk as if some one had taken hold of them, and the wings ring as if they had been struck by a metallic substance.

Ascending or descending currents, however, upset the equilibrium of only the slow or low-powered machines. In a school machine, say the Curtis N9, you feel the effect of air disturbance such as bumps much more than in a high-powered plane. It is much harder to fly in a low-powered machine in the instruction field than it is in the high-powered scouting or warplane.

Looping with a seaplane but a few months ago was declared impossible. To-day it is safely being done, notwithstanding the weight of the boat and the resistance its floats or pontoons offer to the air.

The number of hours of "solo" work after the student has finished his instruction before he is allowed to qualify, differs with his degree of intelligence, courage and perseverance, and with the specific requirements of the different branches of the service.

The navy requires after completion of instruction a minimum of twenty-five hours in the air before taking the qualifying test. This, of course, does not mean continuous flight, but many frequent and brief ascents.

One Navy test requires ascending a minimum of 6,000 feet, executing certain maneuvers and landing on the water within 200 feet of the vessel. Another Navy test calls for a similar landing after executing certain other maneuvers at a minimum of 3,000 feet above the sea.

All examinations passed and all tests

(Continued on page 64)



The errors demonstrated in flight are promptly and carefully corrected by the instructor



Illustration of a new type of French plane with two powerful guns mounted on top

America's Part in Supplying Aircraft

By Gustav V. Capart

Consulting Engineer on the Staff of General Petain

AERONAUTICS must be considered from two points of view. The first is the military point of view. The second is the industrial.

I am sure that the American people have not any idea of the extreme importance of the question of aeronautics. To-day it is very interesting to know how great is the tactical application of aircraft compared with that of yesterday, and by that I mean the battle of the Marne. During this battle, the aerial activities were confined solely to reconnaissance and marks the embryo or beginning of aeronautics in relation to the conduct of modern battle. Without the several aeronautic units at the present moment the recent Allied advance on the Aisne and in Flanders could not have taken place. The tactical application of aeronautics on all fronts, and I herewith include German strategy, and therefore divulge no secrets, is the same.

The aerial service may be divided into special branches, the first of which I may designate as the scouting service.

The role of the scouting aeroplane is to give the General Staff intelligence regarding the situation of the enemy, to transmit orders from one point of the sector or front to the other, and in other ways be of service to the General Staff.

The second specialty of the aeroplane is the direction of artillery fire. To-day the successful results of battles depend upon the observers who direct the fire by the use of wireless telegraphy. This is a great organization because each group of artillery, the field artillery, heavy artillery, and the artillery that moves on steel tracks, have aviation squadrons and balloons solely for the direction of fire. The observers must be men of

(Captain Capart recently returned to France from America, where he has been four months member of the French Scientific Mission in an advisory capacity. He is one of the foremost authorities on industrial organization and the tactical use of the specialized unit in modern warfare. At the commencement of the war he was an electrical engineer in Belgium and enlisted as a private. He bears the uncommon distinction of having been the only soldier who fought at the battles of Antwerp and Verdun. He is now consulting engineer on the General Staff (Etat Major) of General Petain. He has participated in the battles of Verdun, Champagne, the Somme and the Great Dunes in Flanders. After a careful survey of the aeronautic situation in the United States, he wrote the article that follows, just before leaving for France, stating that the subject was of first importance to America and the Allies.)

quick intelligence and be able to determine a situation at a glance, and this depends a great deal upon previous training and mental acuity.

The most popular specialty is the fighting service. This role is very complex. The air fighter must destroy the enemy aeroplanes and protect the observing and photography aeroplanes. In the beginning of the war, the tendency was to have individual fighting planes go out alone. Now they go in squadrons and in the near future it is possible to see whole fighting aerial divisions.

The photographic service of the air also plays its unique and important part. To-day it is vital to secure the constant transformation of the map of the battlefield. Specialists on aerial photography are continually taking pictures of the enemy's lines. The importance of this branch of the service can be understood by the following illustration:

At one time during the battle of the Somme it was urgent to obtain a photograph of a

particular section of German trench. An aeroplane was sent up, took the picture, returned and developed it, and presented the desired section of trench to his intelligence officer. He had been gone just thirty minutes.

We now have the bombarding aeroplane. This branch of the service is so necessary and important, that it needs but little explanation. The role of the bombarding aeroplane is to destroy the enemy's factories, ammunition stations, railroads and connecting narrow-gauge lines of communication, roads and cantonments. In the daytime it bombards the troops themselves and has a great demoralizing effect on the soldiers.

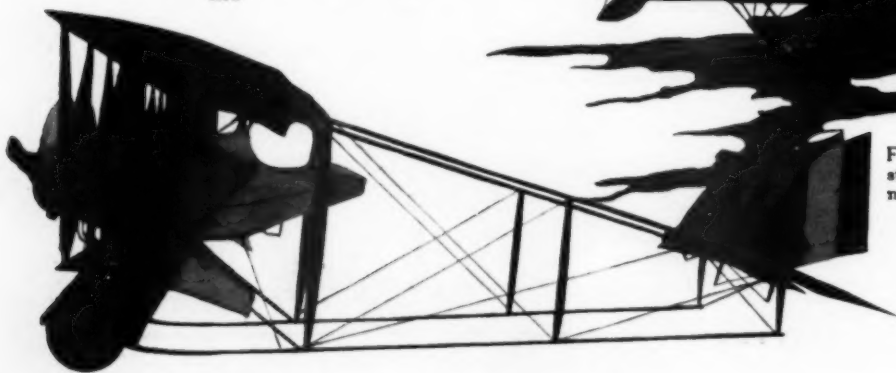
Another specialty is the squadron for the protection of towns and cities. It is to ward off Zeppelins and enemy aeroplanes. The former are now without military value as they are completely at the mercy of the faster and more manageable aeroplane.

Now, it is the role of all armies to have the infantry aeroplane. It is a service which is at the disposition of the colonel of the infantry. It is the eye of the commanding officer and its uses are paramount.

What we have seen gives us a very good idea of the necessity of pushing the organization of each special branch. Of course, at the same time, it is of the utmost importance to create good aviation schools and in these schools to have competent technical and practical instructors. There must be departments for training the fighting men, the bombardier, the pilot, observer, of the photograph, and the mechanic.

Dealing with the industrial side of the ques-

A French biplane used for reconnaissance, aerial photography and directing artillery fire



French seaplane starting for a submarine patrol trip

tion, it must be emphasized that the quality of this branch of the service must be of the highest. For example, the speed of bombarding aeroplanes must be great, but above all the machines must have the power to carry heavy loads of bombs. Besides, it is necessary to have three or four machine guns to repel the attacks

of Zeps.

It appears clear to every one in America that to win the war the Allies must maintain supremacy in the air.

To-day time is not money—it is blood, and the United States must in a very short time build huge aerial armies. There is no doubt that the standardization of aeroplane construction will be a great success and the Liberty motor is the best example.

The men going into this special service must have good physique and morale. It is not incorrect to say that the flying corps of the army is the aristocracy of the army. The fighting aviator plays a chivalrous role—the observer plays a most difficult role. There his personality is burdened with a great responsibility. It is paramount that we have supreme intelligence and sang-froid. It is my opinion, after four months of close observation at your military centers and training camps and schools, that the American youth will fill this role in a very short time.

In conclusion, what I desire to say is that it is vitally essential to get in the shortest period possible a great organization exactly the same as the French and English army have. For example, in Canada it is possible to see in the same district, technical schools and practical schools, factories for construction and repair shops. The grouping of these industrial plants gives

the young aviator a general idea of the importance of the problem.

I hope also that American industry will make a supreme effort to build aeroplanes for all the above specialties, except perhaps the fighting aeroplanes. England and France have had three years' experience in this important branch of construction. The quality of the fighting plane must be so high that great care and time must be given before efficient combat machines

An Italian seaplane which can make a speed of over 100 miles an hour



are produced. The fighting aeroplane bears the same analogy as to the others, that the chronometer does to the watch. France and England can build these planes in sufficient

quantities, and if America will make the other types for all the Allies, after the standardized idea, it will meet the greatest need of to-day.

What Our Government is Doing for Aviation

(Continued from page 39)

stations for the Coast Guard and this particular development of the air service only awaits the conclusion of peace, while the Coast Guard aviators are serving in the Navy.

Congress has appropriated \$100,000 for the initial steps looking toward aerial mail delivery.

It is a good omen for flying that the United States Government is not only speeding the construction of airplanes and the training of aviators, but is also figuring on internal development of the industry on a peace time basis.

Airplanes that can carry 25 passengers at a speed of 150 miles an hour, ascend over four miles into the air and travel nearly a thousand miles without a stop, have demonstrated their industrial efficiency.

The idea of unusual danger is finally being dissociated from flying. The gale has been robbed of its fury. Improved engines have so fully met and overcome the much-talked-of air pockets, or currents, as to make danger from that source negligible. The chief merit which attracts the attention of the coast patrol is that the airplane can be safely launched into the air and flown above the waves of the sea against a strong adverse wind.

The mystery that has surrounded the navigation of the air has diverted the interest of many practical men to more mundane spheres. The old idea that air is "space" has done much to delude the popular mind, yet the air is a material fluid upon which the airplane can glide and sustain itself in accordance with definite scientific principles, just as readily as a man can support himself in the water.

A hanger is only another name for an air-boat house. Its construction is simple and its cost is by no means prohibitive.

Before leaving this subject let us each re-

solve that we will not permit prejudice or indifference to close our eyes to the importance of this science, industry, recreation and sport. Every country in Europe is striving for air

Italian engineers have not been asleep the last three years of the war, nor have the Germans. In fact, our own present development is based upon the recent developments in Europe of the modern science of aerodynamics.

The present production of planes and motors in America, to which we look for assurance of commercial industry and flight after the war, is based not only on Uncle Sam's millions, but upon the expert knowledge so freely furnished by our Allies.

The present production of planes and motors in America will assure commercial flight as soon as the war is ended.

Let us not, however, overlook the importance of work being done in most all European countries. America will not have a monopoly of airplane manufacture or of flying. All of our Allies, all of our enemies and some of the neutral countries are making planes and engines founded upon American genius and invention. We are forced with shame to admit that Germany was a pioneer in the industry. At times since the war began she has been better in the air than our Allies, and is now making every effort to produce planes with which to regain a wavering prestige.

Let us not congratulate ourselves over much on having first place. Let us wait and see if it is ours. At least one of our Allies is spending as much as we are now spending on airplanes, and has decidedly the start of us.

Another phase of aeronautics is the great expansion in industries making accessories. There are magnetos, barometers, cameras, compasses, altimeters, indicators, machine guns, etc.

There is an increasing demand for the labor of skilled women for those tasks on both planes and accessories which require skill rather than physical strength.

Questions and Answers

Air boating is the newest means of travel, recreation and sport. Few people realize how safe it has become or the pleasure the air affords.

Many still think of air boating as a violation of the law of gravity and therefore "Tempting Providence."

Some approve it—for others, but will have none of it themselves.

Still others, satisfied that it is safe, take only a casual interest for lack of definite information.

We believe that air boating should and soon will be as popular as motor boating is today. That many who now for the first time take any serious interest in the air will float upon and glide through it with as much satisfaction and perfect security as speeding over the surface of the water now affords.

In the early days of iron construction men marvelled that heavier than water boats could float.

Today men marvel that heavier than air craft can perform the feats of the modern airplane.

The wonder is followed by a lively interest and men come to ask questions, and that is the reason for this department.

Perhaps there is no subject upon which the public has so little information. This is unfortunate and we hope to be of real service to our readers.

We hope they will ask many questions, and we assure them that we will in each instance endeavor to give them an accurate and satisfactory answer.

supremacy, not only to win the war but for expansion after the war. Already in certain European countries, now engaged in war, some mail and freight routes have been established. Shall America, the home of the airplane, drop back into her old indifference?

Other countries have their efficient planes and their efficient engines. British, French and

YARD AND SHOP

A Standardized 50-Foot Military-type Express Cruiser

The arrangement plan of the standardized 50-foot military-type express cruiser, designed and built by the Great Lakes Boat Building Corp., of Milwaukee, Wis., intends four main compartments: crew's quarters, galley, main cabin and owner's stateroom, each with full head room throughout, besides a large bridge deck and an inviting cockpit. The seat berths in the main cabin form upper and lower berths by night and the extension berths in the owner's stateroom form two double beds by night. Accommodations are afforded for a party of eight and a crew of two.

This cruiser, powered with an eight-cylinder 6 by 6-inch Van Blerck motor, will do 20 to 22 m.p.h., which is most remarkable in view of the fact that the boat is very heavily constructed throughout and has extensive accommodations. All controls are carried to the steering column on the bridge deck for one-man operation.

The 50-footer reflects speed with safety and comfortable accommodations. Moreover the range of speed can be varied with ease from barely perceptible movement through the water to over 20 m.p.h. This flexibility of speed, together with an open cockpit, the



The March issue of MoToR Boating will be our Annual Fitting Out Number. It will be brim full of information from cover to cover. In the past our April issue has been the Fitting Out Number, but at the request of many of our readers who believe April to be too late in the season to start work on their boats, we have decided to get out the Fitting Out Number of MoToR Boating a month earlier than usual.



A 26-foot runabout, with a 6-foot beam, owned by Mrs. C. H. Brand, of Saginaw, Mich., was built by the Valley Boat Co., of Saginaw, Mich., and powered with a 20 h.p. Kermath which gives a speed of 16 m.p.h.

sheltered bridge and the protected cabins makes available an ideal boat adapted to cruising in all kinds of weather.

A standardized boat is usually designed better, built better and equipped better, because all details have not only been worked out on paper, but have actually been worked out in practice.

L. E. Joels New Works Manager of Duesenberg Motors Corp.

The Duesenberg Motors Corp., of New York, N. Y., announce that L. E. Joels took over the position of works manager for their big Elizabeth, N. J. factory, effective January 1, 1918, vice Charles B. Page resigned.

Mr. Joels has had wide experience in factory production and factory management, having recently resigned as works manager of the Packard Motor Car Co.

He Also Serves Who Helps a Fighter Fight—Buy Liberty Bonds

The third Liberty Loan will start the middle of February or the first of March. The amount of money to be raised is much greater than was raised in both of the previous loans, and the call upon the country's resources and upon every citizen will be greater than ever.

Because of the increasing needs of the country and the tremendous tasks imposed upon the Liberty Loan Committee in twelve federal reserve districts in raising this loan, it is necessary to call upon everyone to help in the flotation of the bond issue. Accordingly, we take the liberty of appealing to our readers to help in some way in the coming loan and to remember the duty of every citizen, to conserve and be thrifty.

The first two Liberty Loan campaigns proved incontrovertibly that the American people know how to "save and serve." That they will continue in this self-sacrificing, forward-looking spirit is not to be doubted. They have heard and heeded the President:

"Let every man and woman assume the duty of careful, provident use and expenditure as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring."

Gray-Aldrich Co. Represents Caille Perfection Motor Co.

The Gray-Aldrich Co., of 33 Commercial Wharf, Boston, Mass., is now representing the Caille Perfection Motor Co., of Detroit, Mich., handling their in-board marine engines for the State of Massachusetts. The Gray-Aldrich Company has one of the most complete salesrooms and machine shops of any marine engine dealer in the country and is in a position to give the best of service to the trade.

Rapp-Huckins Co., of Boston, Mass., continues to represent the Caille Perfection Motor Company, with the outboard motor line.

When Kerosene is Preferred

The Regal Gasoline Engine Co., of Coldwater, Mich., have just issued their catalogue for 1918 and will be glad to send a copy to anyone writing for it.

In many localities the price of kerosene is much less than that of gasoline. Where such is the case a large saving in the cost of fuel may be obtained by ordering Regal engines equipped to burn kerosene. There is no additional charge made for such an equipment.

In order to burn a low-grade oil, a large amount of heat must be applied to vaporize it. The latent heat, or heat of vaporization of kerosene is much more than that of gasoline. With the latter fuel

the heat may be subtracted from the surrounding atmosphere. That is not the case, however, with the former fuel; in fact, in ordinary carburetion methods a great deal of auxiliary heat must be supplied.

This heat, in Regal engines, is supplied by heating all the air going to the carburetor. The air is drawn through the water-jacket space of the exhaust manifold and conducted by a flexible tube to the special carburetor. In this manner just the exact amount of heat necessary for the complete vaporization is furnished.

On engines with cylinders of over 5-inch bore a small water carburetor is used in order to take a little water vapor into the cylinders with each charge of kerosene vapor. This water prevents pre-ignition knocks and helps the engine run smoothly and quietly.

There is from 5 to 10 per cent. less power developed when burning kerosene than when operating upon gasoline, but as less kerosene is consumed, the amount of work performed per gallon is about the same for both fuels. In purchasing an engine to be operated with kerosene for fuel, it is well to consider this loss of power and to select an engine that is correspondingly larger.

New General Manager for Murray & Tregurtha Co.

Otis Funderburk has recently been appointed general manager of the Murray & Tregurtha Co., of South Boston, Mass.

Look to Your Fire Extinguishers

Experience during 1917 showing some fire extinguishers approved by the Board of Supervising Inspectors were defective and that a standard was desired, the bureau obtained samples of fire extinguishers from all firms whose fire extinguishers had been approved, and these extinguishers were submitted to exhaustive tests by the Bureau of Standards, Department of Commerce, Washington, D. C.

As a result of these tests the list of approved fire extinguishers was considerably reduced, all of which was done in the interest of safety. This means that many fire extinguishers which were considered efficient at the last inspection have been declared unsafe. Make sure that yours is not among these.

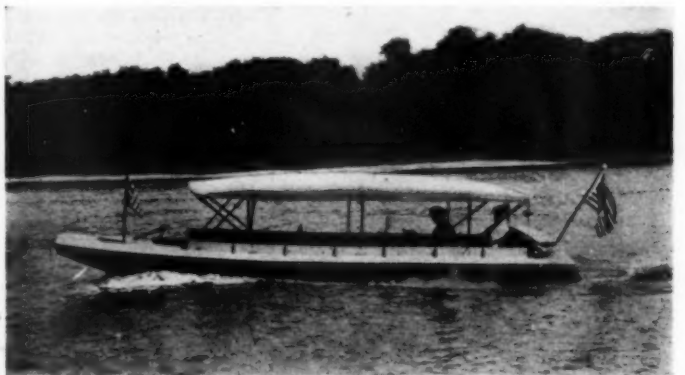
A. J. Schwarber Connects with Red Wing Motor Co.

Announcement is made that A. J. Schwarber, formerly export and domestic sales manager of the Ferro Machine & Foundry Company, is now associated with the Red Wing Motor Co., of Red Wing, Minn., builders of the well-known Thorobred line. Mr. Schwarber's office is in 818 Guardian Bldg., Cleveland, O., from where he is now in charge of the majority of the Red Wing export sales. In the spring he will establish his office either at the factory in Red Wing or in New York City.

The Red Wing's domestic and foreign distribution has been growing tremendously within the past year. They have shipped hundreds of Thorobreds to all parts of the world, and within the last thirty days have crated thirty motors for the Far East, six going to Calcutta, ten to Bangkok, Siam, twelve to Singapore, Straits Settlement, and another shipment to Manila has just been completed. Orders for more than 100 motors have been received from Norway, Sweden, Denmark and Finland.

Overhanging Bow Useful in Making Landings on Rivers

Dr. W. S. Phelps, of Monument, Ill., is the owner of the unusual little craft shown in an accompanying illustration. It is very adaptable for use on the Mississippi and other rivers for convenience in making



The unusual little boat shown above is the property of Dr. W. S. Phelps, of Monument, Ill., and is powered with a four-cylinder 20 h.p. Model D Gray engine which has given him the best of service. Note the overhanging bow which is very convenient in making landings on the rivers



Sand Dab, a 16-foot runabout with a draft of 11 inches, is a shallow-draft speed boat built by the Valley Boat Co., of Saginaw, Mich., and will handle an aquaplane perfectly and this may be done in shallow water so that even the children may enjoy the sport without danger

landings, which may be noted by referring to the overhanging bow.

Dr. Phelps says that he is making 12 m.p.h. without running the engine full speed and tells us that his four-cylinder 20 h.p. Model D Gray engine has given him the best service.

Sand Dab, a 16-Foot Runabout

The Valley Boat Co., of Saginaw, Mich., has developed from the original company formed in Baldwinville, N. Y., and was moved to Saginaw in 1910. They now have a well-equipped factory with about 20,000 feet of floor space on the banks of the Saginaw River with a railroad siding on their property. The marine track runs from the river right into the factory. They are now doing an extensive business in out-board motor rowboats, stock launches and fishing boats and cabin cruisers from 28 to 50 feet in length.

This company does only the best grade of work, and Valley boats are especially noticeable because of their nice appearance, substantial construction and efficiency.

Sand Dab, a 16-foot runabout with a draft of 11 inches, satisfies the longing for a shallow-draft speed, pleasure and fishing craft. The pleasure of riding at 12 m.p.h. in a small seaworthy boat like this compares favorably with speed of 30 miles and more in a larger boat. The boat is light, easily handled and due to



A sturdy little commercial boat powered with a Red Wing Thorobred motor which is giving entire satisfaction to the owner

many refinements can be operated by those who are not familiar with gasoline engines. The boat will handle an aquaplane perfectly, and this may be done in shallow water, so that even the children may enjoy the sport without danger. It is an ideal boat for fishing. It will take you quickly to the fishing grounds and can be run at a slow trolling speed by simply closing the throttle. The boat will handle as many as eight people, and is so steady and seaworthy that it is suitable for a family runabout or tender.

Coupons for Foreign Parts Due January 1, 1918

The War Board has issued the following announcement:

Bankers and others having coupons to collect, due January 1, 1918, for foreign individuals, firms, corporations, or others, are not required, until further notice to obtain licenses from the War Board or authority from the Federal Reserve Board in order to make such collection; provided, that any funds so received which the collecting agency has reason to believe are the property of an enemy or ally of an enemy or will be used for the benefit directly or indirectly of an enemy or ally of an enemy must be held in separate account under notice to the Alien Property Custodian.

Excess Oil Kept Out of the Combustion Chamber

After three years of wide experimentation, the McQuay-Norris Mfg. Co., of St. Louis, Mo., are putting on the market a special ring, designed and manufactured for the correction of oil troubles exclusively. It has been named the McQuay-Norris Superoyl ring and is to be installed in the top groove of each piston solely as an oil ring to keep excess oil out of the combustion chamber.

Probably no piston ring problem in the last several years has bothered engineers, dealers and garagemen alike so much as the increase in oil troubles. Fouled spark plugs, smoking exhausts and terrific carbon deposits have increased markedly with modern motor construction. Much of this is due to the over-powered motor and the manner in which it operates most of

an oil reservoir which collects all of the excess oil from the cylinder walls on each down stroke of the piston. Just the film necessary for lubrication is left. The position and shape of the oil reservoir is the exclusive McQuay-Norris Superoyl design.

This reservoir is cut into the ring with mathematical exactness at an angle of 45 degrees from the intersection of the cylinder wall bearing face to the ring and the ring's lower groove bearing face. This makes a scraping edge of the lower end of the face of the ring which forces the excess oil in the reservoir along its up-

per inside surface. The oil cannot, while it is being scraped into the reservoir, strike against the lower groove bearing of the ring, where it could creep into the groove and around the ring into the combustion chamber, because the lower edge of the reservoir terminates at a point slightly inside of the piston's outer surface. The oil is constantly kept building up against the upper wall of the reservoir until the down stroke is completed, when it is emptied again over the lower rings.

It is only by placing the oil reservoir exactly at the intersection of the ring's two bearing faces—the cylinder wall and the lower groove—that this action can be produced, it is asserted by the manufacturers. A groove or recess in the ring at any other position, they declare, does not make it impossible for the excess oil, which is always under pressure on the piston's down stroke, to be forced under the ring and into the groove to work its way around the groove and then out into the combustion chamber.

The Superoyl is a concentric ring with



Mary Jane, the property of J. M. Rowland, is powered with a Model F eight-cylinder Sterling and with this boat and J M R, Mr. Rowland cleaned up practically everything in sight at Atlantic City

per inside surface.

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Engineers Wanted by the U. S. Public Service Reserve

The Army and Navy staff departments continue to demand men of engineering experience, especially in industrial lines. At present the outlook is that this demand will continue throughout the period of the war. In calling attention to this, the United States Public Service Reserve, Washington, D. C. (where records of men willing to serve when called will be kept on file), points out that a man of engineering experience has a rare combination of opportunities open to him, which are not open to the average patriotic American, as follows:

1. To serve the country in his most effective capacity.
2. To keep in touch with his own profession, with the result that his patriotic service will not have caused him to become rusty by the time peace returns.
3. To become a commissioned officer and receive much better pay than the average man who has wholly subordinated personal interests and now works for the national good.
4. To perform his service usually without leaving the United States.

Economical Power for Marine Motors

With the present high price of gasoline, kerosene and crude oil and prospects of still higher prices, the owners of large motor boats, especially of commercial boats with heavy-duty gasoline motors, are figuring their operating costs more closely every month. The

use of kerosene cuts down the expense somewhat; but as a rule, it cannot be used to the best advantage in an out-and-out gasoline motor. Oil engines are expensive and deliveries slow. The problem resolves into finding a cheap fuel for the gasoline engine.

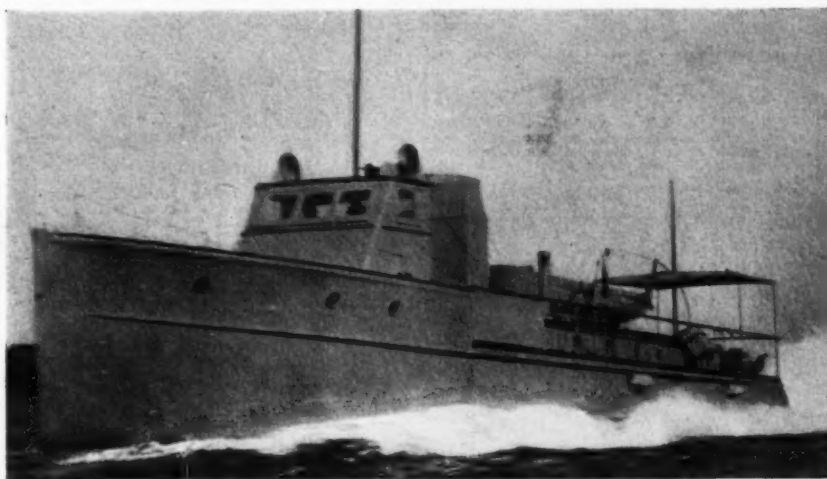
A gas producer using the small cheap sizes of anthracite coal will solve this problem. Producer gas can be used in the ordinary gasoline motor with only minor changes in the equipment, and the power output will be practically the same as when gasoline is used.

The Galusha Gas Producer built by the Nelson Blower & Furnace Co., of Boston, Mass., is built in sizes and models especially designed for marine work. This producer works under a slight vacuum, so that there is no danger of gas escaping from leaks, and there is no danger from explosions.

The best results are obtained from anthracite pea coal, the one important quality being a coal that produces an ash that fuses only at high temperature, otherwise the grates become clogged. Special producers are built to operate on almost any grade of coal. A comparison of the cost of fuel for one brake horsepower per hour is as follows:

Gasoline engine, gasoline at \$0.20 per gal.	\$.025
Kerosene engine, kerosene at .12 per gal. ....	.015
Diesel engine, oil at .05 per gal. ....	.0033
Producer gas, coal at 5.00 per ton. ....	.0025
Producer gas, Breeze coke at 2.00 per ton. ....	.0015

Galusha producers for marine service are built in thirteen standard sizes ranging from 18 to 350 h.p., giving entire satisfaction wherever installed, and saving boat owners money. A typical example of the economy effected is given in the letter reproduced herewith.



Daiquiri, a 62-footer with an 11-foot beam, owned by Charles F. Ayer, Osborne Howes, Frank S. Eaton and Oliver Ames, was designed by A. L. Swasey and N. G. Herreshoff and built by the Herreshoff Mfg. Co. She is powered with twin Model F eight-cylinder 200 h.p. Sterlings, which total 400 h.p., giving a guaranteed speed of 24 1/2 m.p.h. with an actual speed of 27 m.p.h.



A 28-inch cylinder after being repaired which had 80-inch scores caused by lack of lubrication. The size of this job is clearly shown by comparison with Mr. Lawrence standing beside the cylinder

February 11, 1917.
Nelson Blower & Furnace Co.,
11 Elkins Street,
Boston, Mass.

Gentlemen:—

The Tug "George C. Van Tuyl," equipped with a Galusha Gas Producer and a Wolverine engine of 110 h.p. has proved a success and is all and more than I expected.

Economy of operation is the most important factor in these days of high prices for fuel. At the close of navigation I paid \$8.50 per ton for bituminous coal at Albany for my steam tug, using two tons per day. I can do the same work to-day with my tug equipped with your producer plant on a half ton of pea coal, which, at the present time, costs but \$3. This runs the tug for ten hours.

We warm up the engine in the morning for five or ten minutes with gasoline as fuel and then switch to the producer gas. This engine has three cylinders, 12½ x 14 inches, and we would use from 10 to 12 gallons of gasoline per hour. From this you can see how economical the producer gas is, as compared to gasoline. Pea coal will probably cost me \$4.20 to \$4.50 per ton in the spring and gasoline is selling at 25 cents per gallon now.

The tug developed a speed on her trial trip of eleven miles per hour, which is exceptionally good for a vessel that is built on such full lines, 50 x 14 x 5 feet. She will carry twelve days' fuel under decks, but we could double this capacity if necessary. She draws five feet of water. We could operate in four by keeping the coal out of the after timbers.

The boat was laid up December 31, 1916, and when I went aboard, three weeks later, the fire was alive in the producer. Under these circumstances we could have been under way in one hour and most of that time would have been spent repacking pumps and coupling pipes that had been disconnected for the winter.

The coming season we will use the tug on the Hudson River towing sand and gravel scows of 600 to 800 tons capacity.

All pipes are of brass for salt water work.

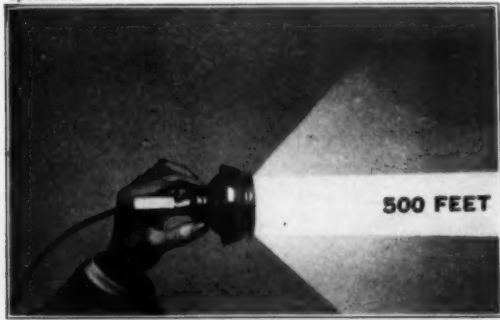
Joiner work is of the low type for canal use, but if needed for other purposes it could be raised so that the pilot house would be on the upper deck as the vessel is staunch and of good beam.

No licensed officers are required while operating as a tow boat and no inspection is necessary by the local authorities. If in passenger service, however, one licensed operator is needed.

I find the plant very dependable and very easy to operate.

Yours very truly,
ULSTER DAVIS, Captain.

The scarcity of coal will probably effect the operation of a number of the smaller steam propelled boats. With a gas producer the consumption of coal is kept down to a minimum and provides for continuous operation.



Cellbeam throws a powerful penetrating beam of light that clearly illuminates objects 500 feet or more distant. At the same time it gives a non-glare general illumination which covers a wide area near by

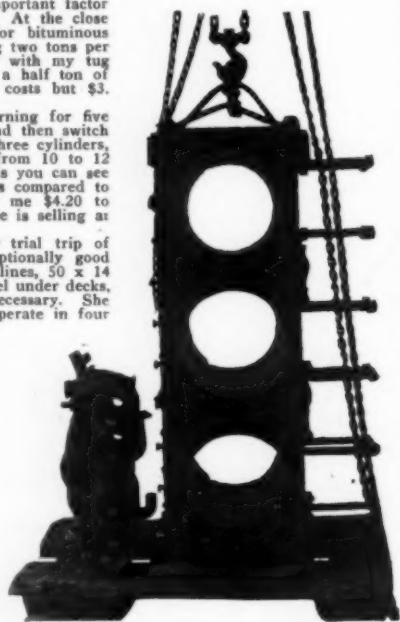
Coast and Geodetic Survey Locates Sub-office at Boston

To keep more directly in touch with the interests of shipping in the waters of Maine, New Hampshire and Massachusetts, the United States Coast and Geodetic Survey, Department of Commerce, will establish a sub-office in the Custom House at Boston about January 1, 1918. An inspector in charge of this office, Homer F. Ritter, a commissioned officer of the Survey, will be prepared to furnish information relative to the operations of this branch of the Government service.

It will be the endeavor of this sub-office to co-operate fully with steamship lines, yacht lines, mariners and others to the extent that dangers discovered, changes in channels, and various other kinds of information needed by the Survey for keeping its nautical publications up-to-date shall be made available to the public as promptly as possible.

A complete and up-to-date file of charts and publications relating to our coasts and surveys will be available for inspection to those interested, and the office will maintain a supply of the charts and other publications of the Survey for sale at catalogue prices.

Scored Cylinders Repaired Without the Use of Heat



Cylinder casting from one of the six-cylinder, 12 by 14-inch Standard engines in James D. Lacey's 105 by 15½-foot motor yacht Alcaldia after the wrist pin scores had been filled by the Lawrence process. Beside it is a ¾-inch bore automobile cylinder casting

from the smallest automobile or marine motor to the largest stationary steam engine cylinder, and on scores of any size from the smallest caused by lack of lubrication or grit in the cylinder to the deep groove cut by a loose wrist pin nearly through the cylinder wall. The time actually required to clean, fill and finish a badly scored gasoline motor cylinder is well under one hour.

The Lawrence process is not used for welding cracked or broken cylinders, it is applied only to filling scored cylinders. The company is also prepared to do all ordinary welding work on cracked or broken castings.

A Combination Searchlight and Trouble Lamp

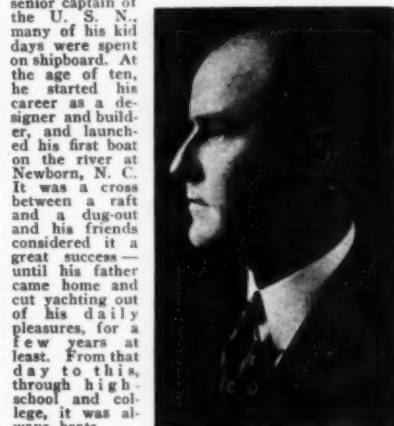
The problem of a small but powerful searchlight for use aboard a motor boat for locating moorings, landings, buoys, etc., at night, has been solved by the Cellbeam Mfg. Co., of Brooklyn, N. Y. They have produced a portable lamp that will project a strong ray of light for a distance of 500 feet and also a diffused light at a wide angle which makes this device doubly useful aboard a boat as it can be used as a trouble lamp around the motor and to locate missing articles in lockers and dark corners, as well as for a spot-light.

The lamp is substantially made of a rust-proof silver composition, and one of the special features is, that should it actually be immersed in salt water for several days, a little silver polish will bring the entire lamp and reflector back to their original condition. Owing to its small size, 3½ inches in diameter and 5½ inches long, this lamp takes up less room than the ordinary trouble lamp.

Personalities

William Henry Hand, Jr.

Billy Hand's first appearance was made in Portland, Me., in December, 1875. As he



William Henry Hand, Jr.

is the son of a senior captain of the U. S. N., many of his kid days were spent on shipboard. At the age of ten, he started his career as a designer and builder, and launched his first boat on the river at Newborn, N. C. It was a cross between a raft and a dug-out and his friends considered it a great success—until his father came home and cut yachting out of his daily pleasures, for a few years at least. From that day to this, through high school and college, it was always boats.

During the last twenty years he has produced some of the fastest boats in this country. He originated the V-bottom type of motor boat and is partly responsible for the advent of express cruiser racing in this country. As assistant to the U. S. Shipping Board, he helped Uncle Sam start the Emergency Fleet programme in New England and for several months devoted his entire interests to this great cause—with much success.



G. R. Richardson

Last, but not least, he is a true follower of Isaac Walton and if you call at his office some calm, hot day in July and find that he is away on business, you can guess that the business is about ten miles south of Noman'sland in the sword-fish country, for he is (as the Gloucestermen say) "high-line" on sword-fish and sea bass.

G. R. Richardson

G. R. Richardson was born and brought up in a small town in Michigan, where he graduated from High School in the meantime learning the carpenter trade with his father. After finishing his schooling he went to Bay City and there started in building boats for the Bay City Yacht Works, which later consolidated with the Brooks Mfg. Co. in 1906.

In 1906 he came East and worked for the Niagara Motor Boat Company, which had just been organized.

In 1909 he started in business for himself, principally on his nerve, as he had practically no capital. Although things went rather slowly at first, there was a gradual growth, and in 1911 a new factory was built. The growth has been steady and healthy ever since, and this last year the Richardson Boat Company turned out three times the business that they have had in any other year.

Mr. Richardson is the sole proprietor of the Richardson Boat Co., of North Tonawanda, N. Y., and oversees everything himself, giving practically everything his personal attention. In his many years in the business he has learned almost all there is to know about the marine industry, and is now turning out excellent outfits reasonably priced, due to the fact that there are no high-salaried officials, no rents, and low overhead expenses.

New Books of Aeronautics

The Journal of the Society of Automotive Engineers for December, 1917, gives the following list of aeronautic books which should be read: Langley Memoir on Mechanical Flight, by Langley and Manly.

Aerial Navigation, by Sir Geo. Cayley.

Aerial Locomotion, by F. H. Wenham.

Gliding, by Percy Pilcher.

The Flight of Birds, by G. A. Borelli.

L'Empire de l'Air, by L. P. Mouillard.

Airships, Past and Present, by A. Hildebrandt.

Aircraft in Warfare, by F. W. Lanchester.

The Aeroplane, by A. Fags.

Bird Flight as the Basis of Aviation, by O. Lilien-thal.

Design of Aeroplanes, by A. W. Judge.

The Mechanics of the Aeroplane, by Captain Duchene.

Aircraft, by M. A. S. Riach.

Pocket Book of Aeronautics, by H. W. L. Moedebeck.

The world's most
famous speed-boats
are Valsparred!

The fame of *Miss Detroit II* and *Miss Minneapolis* has resounded throughout motor-boatdom. Their marvelous speed and wonderful endurance are triumphs of building and engineering efficiency.

Of course, every item of their equipment is of the best, and so Valspar is used exclusively on these as on nearly all other high-class speed-boats and cruisers.

Valspar is waterproof and wearproof. It stands up better under high speeds and long exposure to water, sun, wind, and storm because it is a long-oil varnish. Therefore it does not turn white, blister, or crack off but retains its elasticity and brilliancy far longer than other "spar" varnishes.

You will avoid trouble, disappointment, and "days off" for revarnishing, if you use Valspar on your boat.



For your paint-work use Valentine's Yacht White, Valentine's Yacht Black, Valspar Bronze Bottom Paint and Valspar Enamels.

VALENTINE & COMPANY
456 Fourth Avenue, New York City

ESTABLISHED 1832—Largest Manufacturers of
High-grade Varnishes in the World

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W. P. FULLER & CO., Agents for Pacific Coast:					
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Stockton	San Diego	Pasadena	Long Beach	Santa Monica	
Portland	Seattle	Tacoma	Spokane	Boise	

Copyright, M. Rosenfeld, N. Y.

How *Miss Detroit II* with *Miss Minneapolis* at her heels looked from an aeroplane as they dashed over the course at Minneapolis

When writing to advertisers please mention *MoToR BOATING*, the National Magazine of Motor Boating
Advertising Index will be found on page 110

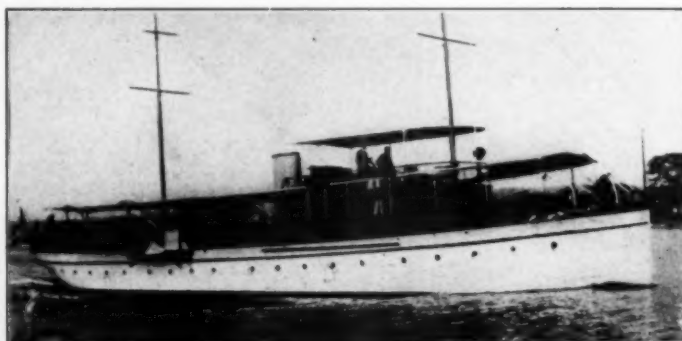
Naval Architects
and
Yacht Brokers

COX & STEVENS

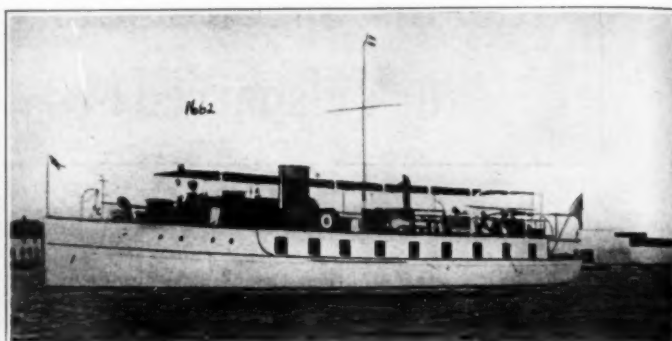
15 William St., New York
Telephone—1375 Broad
Cable—BROKERAGE

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.

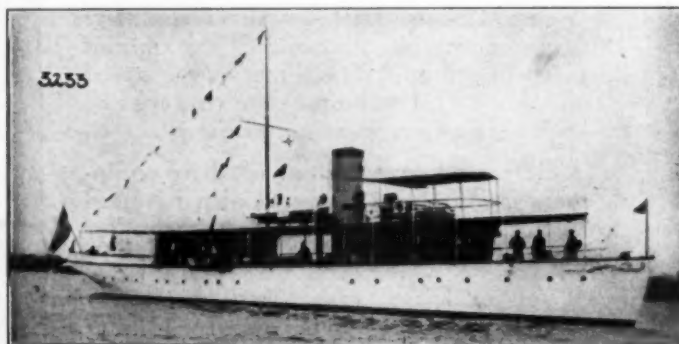
WINTER CHARTER—We specially offer several modern GASOLINE HOUSEBOATS particularly adapted for FLORIDA waters. The demand last season greatly exceeded amount of available craft; these conditions will doubtless prevail this Winter, therefore early arrangements are advised.



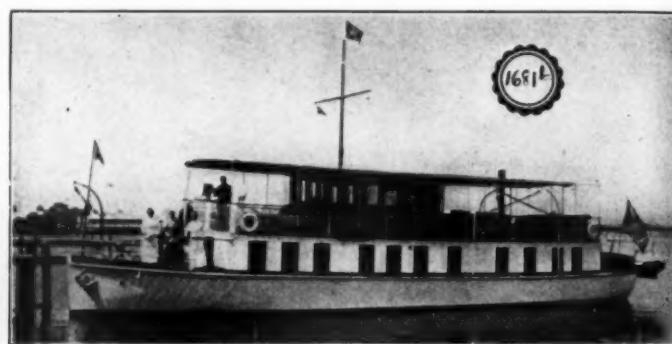
No. 1796—For Sale or Charter—Very roomy, twin screw cruising power yacht, 99 x 17 x 4 ft., adapted for Florida service. Speed 12-14 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms; all conveniences. Cox & Stevens, 15 William Street, New York.



No. 1662—For Charter—Attractive 90 ft. twin screw gasoline houseboat; speed 10-12 miles. Large saloon, four staterooms, two bathrooms; all conveniences. Handsomely furnished. Cox & Stevens, 15 William Street, New York.



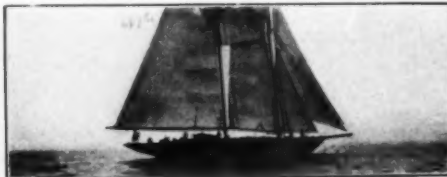
No. 3235—For Sale or Charter—Particularly desirable 123 ft. steel yacht. Speed up to 17 miles. Recent build. Dining saloon and social hall on deck; five staterooms, two bathrooms, etc. Cox & Stevens, 15 William Street, New York.



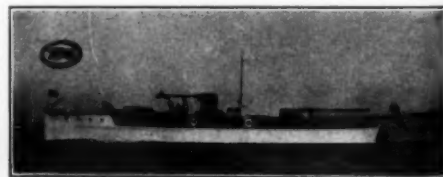
No. 1681—For Sale or Charter—Modern, shoal draft, twin screw gasoline houseboat; 70 x 16.9 x 2.6. Speed 10-11 miles. Large main saloon, three double staterooms, bath, three toilets, in addition to deck saloon. Cox & Stevens, 15 William St., New York.



No. 3151—For Sale or Charter—Modern, twin screw gasoline houseboat; 77 x 17.6 x 3 ft. Speed 11 miles. Dining and main saloon, four staterooms, two bathrooms, etc. Attractively fitted. Cox & Stevens, 15 William Street, New York.



No. 647—For Sale—Modern, flush deck, light draught, auxiliary schooner yacht, 106 x 75 x 24.6 x 5.6 ft. Speed under power 9 knots. Large saloon, three staterooms, two bathrooms, electric lights, hot water heating plant, etc. Cox & Stevens, 15 William Street, New York.



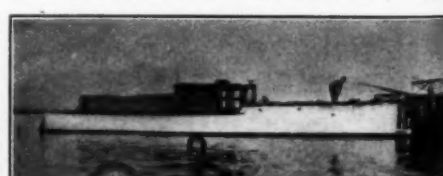
No. 3495—For Sale—Practically new, roomy high speed cruiser (similar to photo); 76 x 13 x 3.6 ft. Speed up to 23 miles. Dining saloon and galley forward, two double staterooms, bath and two toilets aft. Handsomely finished and furnished. Large bridge and cockpit space. Cox & Stevens, 15 William Street, New York.



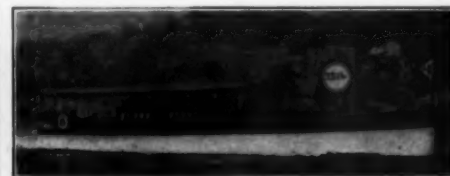
No. 1692—For Sale—Handsome gasoline cruiser; 66 x 13 x 4 ft. Speed 11-12 miles; 6 cyl. Standard motor. Dining saloon and galley forward; two double staterooms and bath room aft. Best construction and finish. Cox & Stevens, 15 William Street, New York.



No. 3529—For Sale—Fast, up-to-date 60 ft. bridge deck cruiser. Speed 18 miles; 8 cylinder Van Blerck motor (new 1917). Double stateroom, saloon, large galley, etc. Cox & Stevens, 15 William Street, New York.



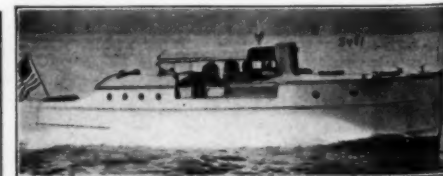
No. 2515—For Sale—Fast 58 ft. cruiser; speed up to 17 miles; 70 H.P. 6 cylinder motor. Recent build. Roomy saloon, toilet, electric lights, etc. Low price. Cox & Stevens, 15 William Street, New York.



No. 3526—For Sale—High speed 53 ft. bridge deck day cruiser. Built 1916. Speed up to 23 miles; 8 cyl. Speedway motor. Best construction and finish. Accommodations for two in saloon, galley, toilet, etc. Cox & Stevens, 15 William Street, New York.



No. 3530—For Sale—Smart 50 ft. bridge deck cruiser. Built 1915. Speed 11-14 miles; 65-85 H.P. 6 cyl. motor (new 1916). Exhibited at New York Motor Boat Show. Double stateroom, saloon, etc. Handsomely finished. Cox & Stevens, 15 William Street, New York.



No. 3481—For Sale—Practically new, high speed bridge deck cruiser; 50 x 11.3 x 2.9 ft. Speed up to 24 miles. 200 H.P. Van Blerck motor. Double stateroom, saloon, electric lights, etc. Handsomely finished. Cox & Stevens, 15 William Street, New York.

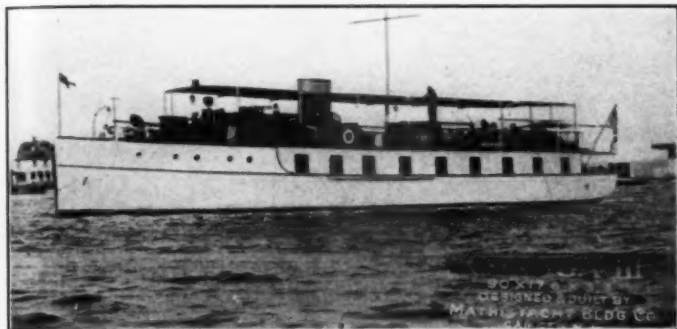
TAMS, LEMOINE & CRANE

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52 Pine Street
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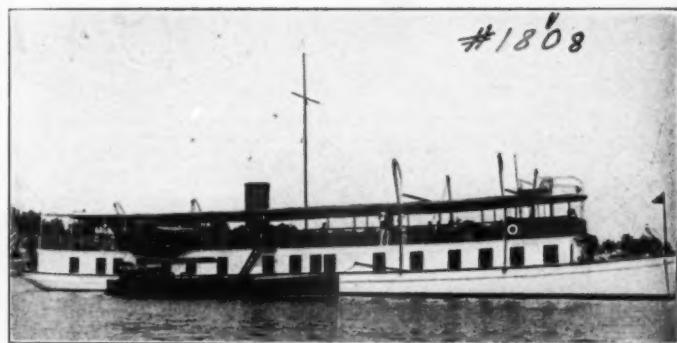
Offer for charter the following desirable houseboats all of which are admirably suited for Florida waters



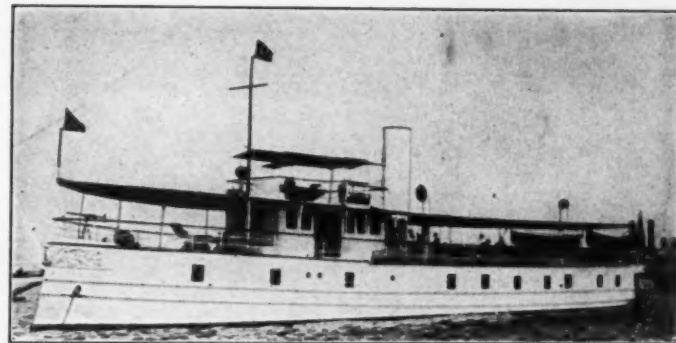
No. 1865—Exceptional opportunity to charter one of the best houseboats available. 90 ft. over all, 17 ft. 6 in. beam and 3 ft. 6 in. draft. 3 staterooms, maid's room, 2 bathrooms and dining saloon.



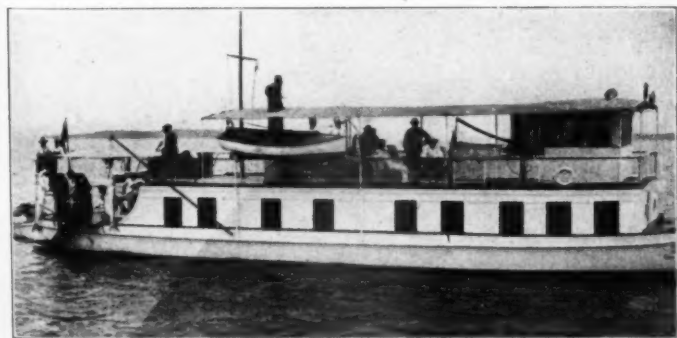
No. 1820—Charter—Desirable houseboat in southern waters, 103 ft. x 20 ft. 4 in. x 3 ft. draft. 4 staterooms, 2 bathrooms, dining saloon and large sitting room.



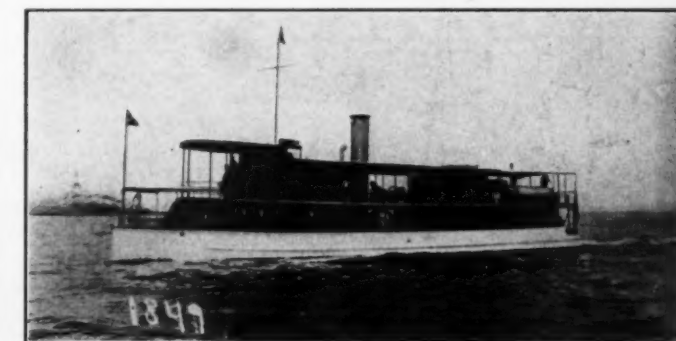
No. 1808—Sale—Charter—Now at Miami. Admirably suited for Florida waters. 125 ft. x 17 ft. 8 in. x 3 ft. 4 in. draft. 4 staterooms, 2 bathrooms, very large dining saloon, ice machine, etc.



No. 243—Sale—Charter—Twin screw steam houseboat, 116 ft. x 21 ft. x 4 ft. draft. 4 staterooms, 3 bathrooms, dining saloon and smoking room.



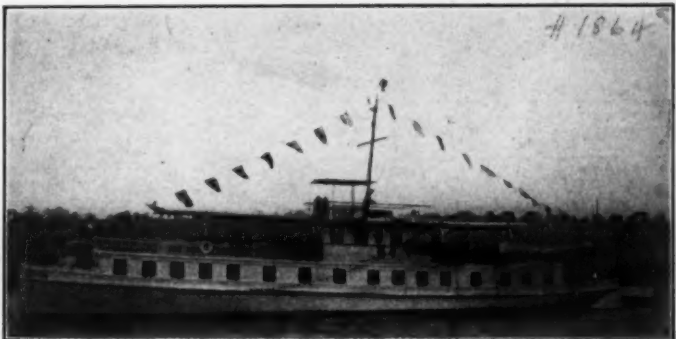
No. 1860—Charter—Shallow draft twin screw houseboat, 70 ft. x 18 ft. 6 in. x 18 in. draft. 3 staterooms, bathroom, dining saloon and pilot house.



No. 1849—Charter—Desirable houseboat, 115 ft. x 17 ft. x 3 ft. 6 in. draft. Speed 12 miles. 5 staterooms, 3 bathrooms, main saloon, dining saloon, smoking and sitting rooms.



No. 1847—For Charter—Houseboat now in Florida waters, 85 ft. x 18 ft. x 28 in. draft. 4 staterooms, bathroom, large dining saloon, sitting room, etc.



No. 1864—Charter—Now in Florida waters. Modern houseboat, 110 ft. x 20 ft. x 4 ft. 9 in. draft. 4 Staterooms, dining saloon, sitting room, etc.

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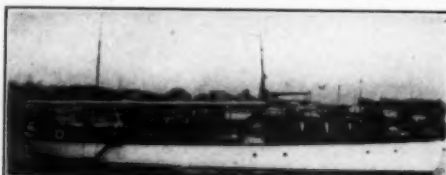
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We have a most complete and up-to-date list of steam yachts, power yachts of all sizes, sail, auxiliary and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request.

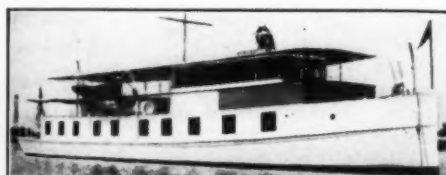
FOR SOUTHERN CRUISING this Winter we offer a number of very desirable POWER HOUSE BOATS and POWER YACHTS which are specially adapted for FLORIDA waters. Last season a great number of clients were much disappointed in not being able to secure for charter a suitable POWER HOUSE BOAT or POWER YACHT owing to the great demand. Yachting this coming WINTER SEASON promises more activity than ever before—so—CHARTER A BOAT NOW AND BE ASSURED OF ONE THIS WINTER. We can render invaluable assistance in expert appraisals, supervision of alterations and estimates.



No. 3710—SALE—CHARTER—Well appointed, roomy 99 foot twin screw motor yacht. Especially adapted for Florida. Six staterooms. Standard motors. Gielow & Orr, 52 Broadway, New York City.



No. 3957—SALE—Able 75 foot cruising power yacht. Dining saloon on deck, three staterooms, bathroom. Standard motor. Well taken care of. Gielow & Orr, 52 Broadway, New York City.



No. 5565—CHARTER—83 foot cruising houseboat. Five staterooms. Two bathrooms. Now in Florida. Gielow & Orr, 52 Broadway, New York City.



No. 6025—SALE—Well ventilated and roomy 73 foot twin screw power yacht. Located in Florida. Two staterooms. One bathroom. Gielow & Orr, 52 Broadway, New York City.



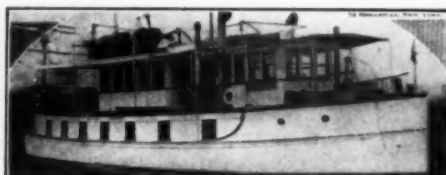
No. 5376—CHARTER—Handsome and well appointed 77 foot twin screw houseboat. Three staterooms. Two bathrooms. Deck house. Gielow & Orr, 52 Broadway, New York City.



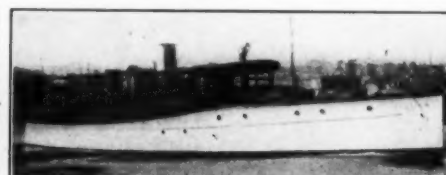
No. 1472—SALE—71 foot deep sea cruising auxiliary ketch. In good condition. Standard motor. Sails new 1916. Two staterooms. New deck 1916. Gielow & Orr, 52 Broadway, New York City.



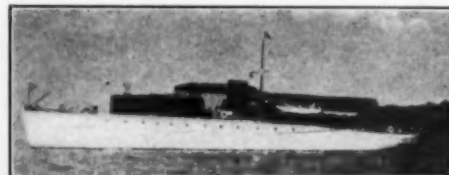
No. 5585—SALE—Popular 45 foot Elco stock cruiser. Standard motor. Owner's private stateroom. Excellent boat for Florida. Price reasonable. Gielow & Orr, 52 Broadway, New York City.



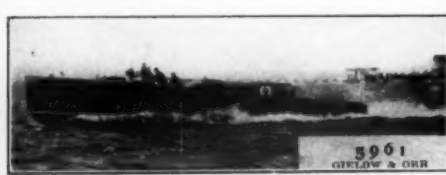
No. 4747—SALE—CHARTER—At Miami this 68 foot twin screw houseboat. Standard motors. Two staterooms. Deck lounging room. Gielow & Orr, 52 Broadway, New York City.



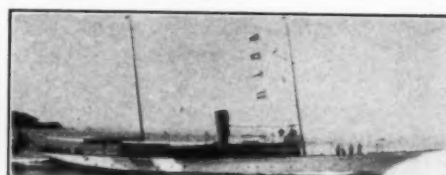
No. 5489—SALE—CHARTER—Fast 72 foot twin screw cruising yacht. Now in Florida. Speedway engines. Two staterooms. Deck lounging room. Gielow & Orr, 52 Broadway, New York City.



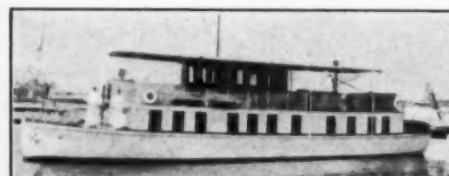
No. 5922—SALE—Unusually successful 110 foot twin screw Diesel Oil engine yacht. Very heavily constructed. Three staterooms. Gielow & Orr, 52 Broadway, New York City.



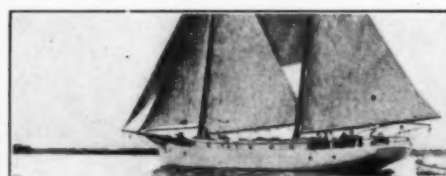
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No. 232—SALE—Handsome and well appointed 145 foot steel steam yacht. In good condition. Two deck houses. Three staterooms. Bathroom. Gielow & Orr, 52 Broadway, New York City.



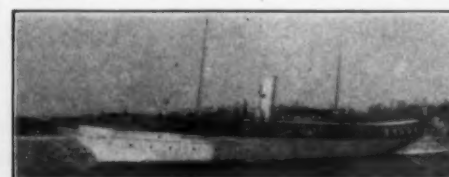
No. 3491—SALE—Located in Florida. 69 foot twin screw power houseboat. Owned by Estate. Designed by us. Three staterooms. Bathroom. Deck house. Sterling motors. Gielow & Orr, 52 Broadway, New York City.



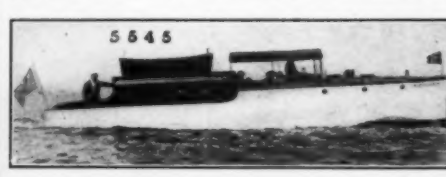
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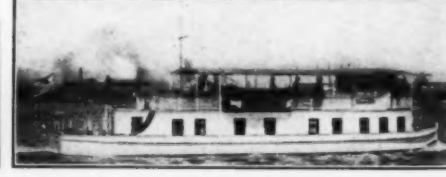
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No. 454—SALE—139 foot steel steam yacht. Five staterooms. Two bathrooms. Two deck houses. Gielow & Orr, 52 Broadway, New York City.



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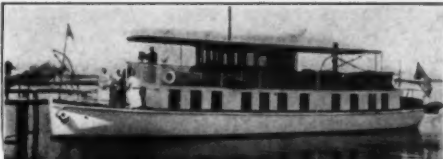
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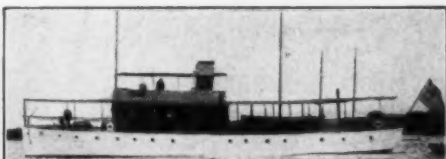
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No. 1937—Diesel Power Yacht, 110 x 18, two 6 cylinder 150/180 H.P. engines, low fuel cost.



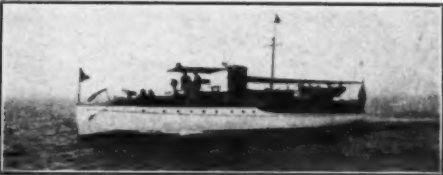
No. 37—Offered by Estate—Florida waters—70 ft. shoal draft houseboat, two Sterling motors, three staterooms, etc.



No. 1821—Flush Deck Power Yacht, 90 x 15.3, two 60 H.P. motors, 3 staterooms, etc.



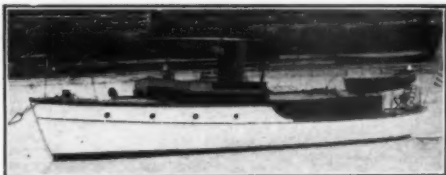
No. 924—Power Yacht, 92 ft., 100/125 H.P. 20th Century motor, splendid deck space.



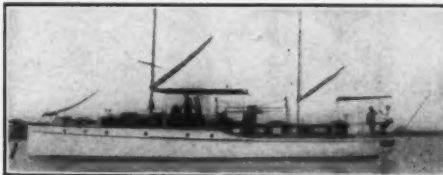
No. 1738—Raised Deck Cruiser, 65 x 11, six cylinder motor, good accommodation.



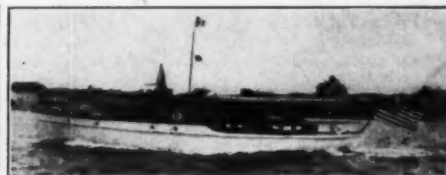
No. 1860—Able 75 ft. Elco built Cruiser, 4 cylinder, 8 x 10 Standard motor, speed 12 miles.



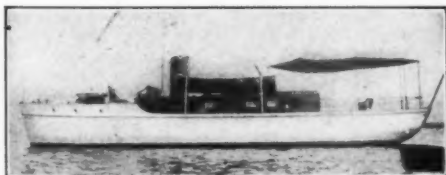
No. 1700—Bridge Deck Cruiser, 52 x 11, Standard motor, with deck controls.



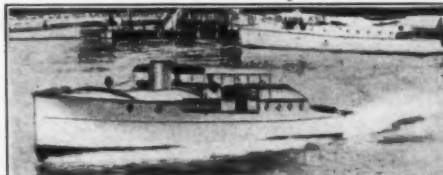
No. 1959—Exceptionally able seaboat, 64 ft., two staterooms, bath, etc.,



No. 1629—Sale—Charter. Splendid cruiser, 60 x 11.6, Murray & Tregurtha kerosene motor, A-1 condition.



No. 1660—Bridge Deck Cruiser, 50 x 10.6, one man control; everything first class.



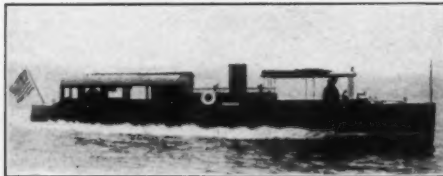
No. 2314—Express cruiser, 50 x 11.3, Van Blerck 200 H.P. motor, speed 22 miles.



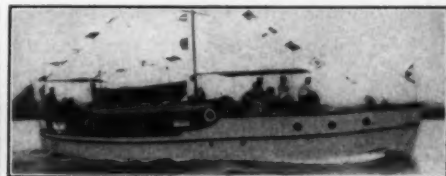
No. 1007—Express Cruiser, 57 x 7.9, six cylinder motor, speed 16-17 miles. Reasonable figure.



No. 2386—New Patrol type, 54 x 11.2, eight cylinder Van Blerck, speed 17 miles.



No. 2358—New Express Cruiser, 45 ft., eight cylinder, 200 H.P. Van Blerck, speed 22 miles.



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No. 58—Sale—Charter. Florida Houseboat 68 x 20.9, draft 30 inches; two 50 H.P. Standards.

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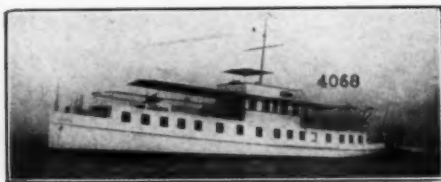
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Our list comprises all the available yachts for sale and charter. Below are a few of our offerings. If none of these appeals to you, write us your requirements. Our knowledge of the yachts we offer, and our 25 years' experience in the business, insure satisfaction to any one buying or chartering a yacht through this office.

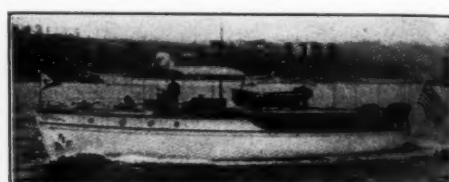
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1913—55 ft. express cruiser. Stateroom, saloon, etc. Speed 17 miles.



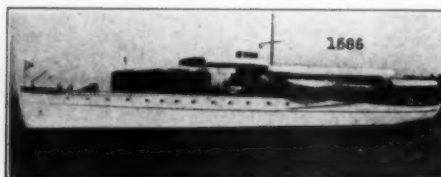
4068—Charter or Sale—Twin screw houseboat 110 foot long. Large accommodation. Now in Florida waters.



1132—60 ft. cruiser. Two staterooms, saloon, bath, etc. Speed 13 miles.



1404—70 ft. power yacht. Twin screw. Two staterooms, saloon, bath, etc. Speed 12 miles.



1586—110 ft. power yacht. Twin screw. Four staterooms, saloon, bath, etc. Speed 16 miles.



1389—90 ft. power yacht. Twin screw. Three staterooms, saloon, bath, etc. Speed 12-14 miles.



1925—50 foot express cruiser. Double stateroom, saloon, etc. Speed 22-24 miles.



1805—45 foot Elco cruiser. Double stateroom, saloon, etc. Speed 10 1/4 miles.



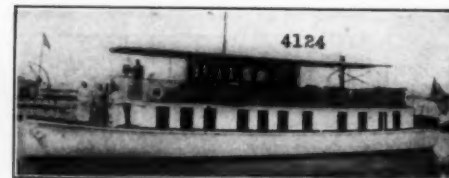
1620—47' express cruiser. V-Bottom type. Speed 18 miles.



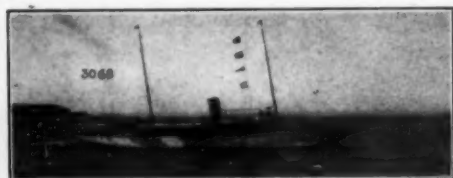
1924—90 foot twin screw power yacht. Three staterooms, dining saloon, bath, etc. Speed 14 miles.



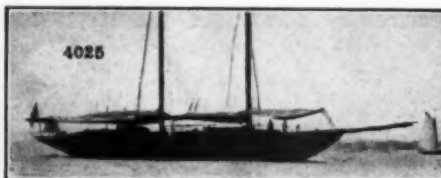
1896—50 ft. twin screw cruiser. Double staterooms, two saloons, etc. Speed 10 miles.



4124—70 ft. twin screw houseboat. Three double staterooms, main saloon, social hall, bath, etc. Speed 10-11 miles.



3068—150 foot steel steam yacht. Splendid accommodations. Speed 18 miles.



4025—106 foot auxiliary schooner, 5 ft. 6 in. draft. Four staterooms, large saloon, two bathrooms, etc. Speed 9 knots under power.



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1911—45 ft. Express Cruiser. Speed 27 miles.



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1883—36 ft. cruiser. Two berths in cabin; toilet, galley, etc. Speed 10-12 miles. Price attractive.

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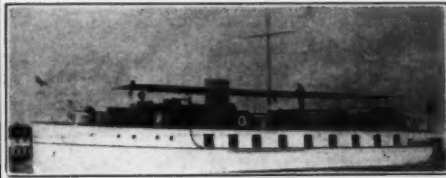
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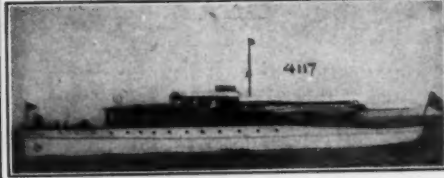
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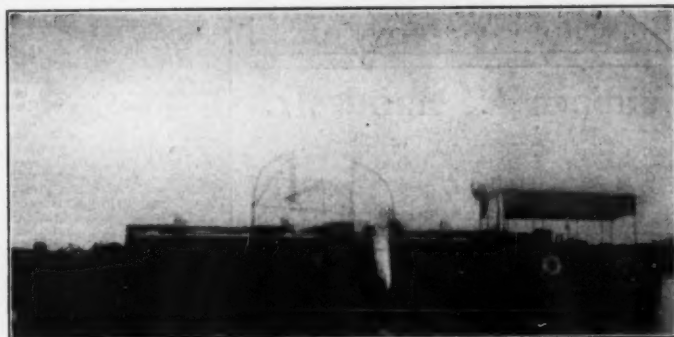
No. 4117—For Sale—110 ft. Power Yacht; attractive in all details; splendid sea boat; Diesel engines.
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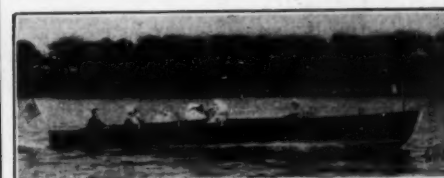
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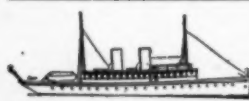
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Smoothing the Bumps

(Continued from page 7)

conditions of your service, will be good to look upon, and have the appearance of a real yacht, and appearance in boats goes a long way. Sooner or later, the time comes when every amateur finds his boat too small or too something else, and she is for sale. If you have constructed a craft that is good-looking and up-to-date in design, the chances of a quick sale at a fair price are very much in your favor; whereas, the same amount of labor and material may be put into a poorly designed boat, which will not bring half as much money. So go carefully over the subject of design.

If you really can't afford to have a boat designed, but are fortunate enough to get good advice on what you need, then "swipe one." Get your chief adviser to pick out one in the magazines which will nearest fit suit, and swipe it clean. Go over the design carefully, and copy it faithfully, detail for detail. Don't make the common error of "improving." You have not reached the stage at which you can weigh every point in its correct value, and as surely as you begin to change a little here and there—a trifle only, it may seem to you,—most surely that you will be starting something that you can't stop. The improved design generally produces a most unsightly boat in the fact that the improver loses all sense of yacht-like proportion. The most common error is the desire for full headroom in small cabin boats. The cabin sides are generally raised so high that the boat resembles a street car or dry goods box afloat, and is really top heavy and dangerous. If your pocket book won't stand for a boat long enough to provide full headroom, be satisfied with a little less and have a good looking boat, so that when you sell you'll realize enough to build that bigger boat.

After you have decided upon a design, the next question is a place to build in. The fellows in the stories nearly always happily find a nice dry barn with a solid floor, etc., been my experience has been that most first boats have been constructed out in the open, a great many right out in the weather and the majority under a flimsy cover. This is an expensive proceeding, as the weather will damage unfinished work beyond repair, and a hull that is alternately wet and dry during construction will never be tight. In order to do good work, the job must be kept dry under all conditions. Space must be provided for the storage of material so that it will be on hand and dry and not get warped and twisted out of shape. Get good covering for your roof. A one-ply prepared roofing is easy to lay, will last a year and a half, and will stay tight if it is properly laid, according to directions on the roll.

If you can find a place to erect your building shed, say in the corner of a fence, it will be no less than 8 feet longer and 8 feet wider than the boat. This is as small a space as can be conveniently worked in, and the open side should have curtains of some old material to keep out driving rain. The shed should be high enough to allow the boat to stand with the keel 18 inches from the ground, and provide four feet headroom over the top of the cabin. The upper part of the shed should have the lumber racks so that all the material may be stored here easy to reach and dry. Of course, a firm floor is very desirable, but not really necessary if one has to pay for building it. When buying material for the shed, purchase lumber such as is used for fencing or such work so that it can be disposed of at the end of the job, with the least possible loss.

You must have a good heavy work bench with a vise. A metal screw doesn't cost much and you can make the wood jaws yourself, taking care to make the whole outfit strong and heavy. Arrange racks for tools on the wall, and make it a rule to straighten up every day as small tools are easily lost if left lying around, to say nothing of the time burnt up in hunting them when needed.

The first things to buy in the line of tools are a grindstone and an oil stone. They are absolute necessities. The grindstone should be a husky one, about 24 inches in diameter and 2½ inches face. It will cost, with the crank and bearings, a dollar or two, and is easily mounted on a wooden horse. Use the stone frequently, and you can keep good, clean, sharp cutting edges on your tools, which means directly good workmanship. You can tell a good mechanic by looking at the condition of his tools, but most amateurs do not realize this important point. Rather than go to the grindstone when the edges of the tools become dulled, or nicked, they rub out the nicks on the oil stone, lifting the blade each time to a higher angle, because it sharpens more quickly. Soon the edge becomes rounded, and the plane, chisel, or hatchet blade, instead of making a smooth clean cut, chews the work and a sloppy looking job is the result. Grind the tools to the angle they show when new, and try the edges with a small tri-square frequently, in order to see that they are perfectly square, and not rounded at the sides.

You will need a good rip saw, cross cut, and a fine back saw. Keep them sharp. Green lumber dills saws quickly, but dry lumber, such as you are going to use, is not nearly so hard on them. If you have not had any instruction in the art of saw filing, don't try on a new one that you value. There is quite a "know how" to filing and setting, and the job must be carefully done, or the saw will run sideways and drive hard. One lesson from a good teacher will give the knack of handling the file so as to get a uniform job, which is really the whole secret. But keep 'em sharp if you have to pay someone to do it, and it's cheaper. You'll have to get a hatchet, claw hammer, two chisels, ¾" and ¼", a ratchet brace, bits from ¼" to ¾". It's better, however, to get these as you need them. You'll also want a hack saw and riveting hammer, a wooden plane, 18 inches long, one about 12 inches, and a small metal smoothing plane. You will probably buy a few more tools from time to time as the job progresses, so add about five dollars extra to your estimate for quality. Cheap tools are the dearest things you can buy on the job.

(To be continued)

Several Schemes Suggested

THERE are two precautions to be taken in straightening a sprung propeller shaft. First, having marked the place and direction of the maximum bend, leave the mark on until you have tested a second time after an attempt to straighten. This is in order that you may know whether your effort has been

(Continued on page 58)

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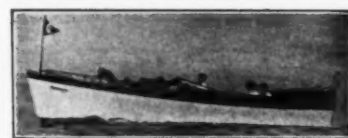
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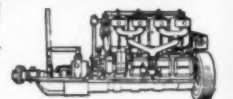
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(Continued from page 16)

must be taken to use a soft linen hand handkerchief, *not a silk one*, in polishing the lenses, and the lenses must be screwed home securely into their mounts. It is best to disassemble one telescope at a time and thus guard against mixing the lenses of several instruments. When the sextant is in good working order as far as its mechanism is concerned it may be adjusted.

The adjustments of the sextant are tabulated and described on page 93 of Bowditch in paragraph 244 and as is stated at the foot of the paragraph only the adjustment of the index and horizon glasses and the adjustment of the line of sight can be made by the navigator. The other conditions mentioned in paragraph 244 are inherent qualities of an instrument once it is built. A photograph shows how the perpendicularity of the index glass is tested and adjusted. The method of adjusting the glass on a modern instrument is also described in Bowditch. On some old instruments there are no adjusting screws on the index mirror frame for tipping it backward and forward and in such instruments the screws holding the mirror frame to the limb must be loosened and a bit of tissue paper slipped under the front or back of the base and the screws tightened up again in order to make this adjustment. The horizon glass must be made perpendicular to the plane of the instrument after the index mirror has been adjusted. On many sextants there will be found two sets of adjusting screws at the base of the horizon glass and the screws that are to be turned are those that can tip the glass backward or forward on the plane of the instrument and not the screws that rotate the horizon glass about an axis perpendicular to the plane, these last mentioned screws being used in correcting the index error of the instrument. In still other instruments the perpendicularity of the horizon glass is adjusted with a key which fits onto a square headed screw at the back of the instrument directly behind the horizon glass. To make the horizon glass perpendicular to plane of the instrument replace the sight tube with a telescope, set the vernier at zero or thereabouts, and focus the telescope on a star or far distant light. Two images of the star will be seen and a few turns of the tangent screw should make one image approach the other and finally pass directly over it. If instead of passing one over the other the images pass side by side the adjustment is not perfect and the proper adjusting screws must be turned until the images become exactly superimposed upon each other as they pass. This adjustment and an alternative method of making it is described in Bowditch on page 93, paragraph 246. If the sextant can be corrected for index error this adjustment should next be made by setting the vernier off zero and directing the instrument at the horizon as when measuring a vertical angle, a sight tube and not a telescope being used. If the adjustment is perfect the reflected image of the horizon will be a direct continuation of the horizon as seen through the unsilvered part of the horizon glass, if this is not the case the index error adjusting screws are to be used in making the necessary correction. A star can be used instead of the horizon in making this adjustment and in fact almost any sharply defined object may be used provided it be a long distance away. The index error cannot be eliminated nor can its magnitude be determined by the use of nearby objects. It is bad practice to be continually adjusting the horizon glass of an instrument in an effort to keep the index error zero. It is far better for the instrument to determine the index error each time an astronomical observation is made and apply the error as found to the observed angle. To find the index error by using the sea horizon direct the instrument towards the horizon as described above and as before make the reflected image of the horizon be a direct continuation of the horizon as seen through the clear part of the horizon glass, this time making the adjustment with the tangent screw of the instrument. When the adjustment is satisfactory read the vernier and apply the reading as an "index correction" to all angles read with the sextant. If the zero of the vernier lies to the left of the zero of the arc the error is said to be "on the arc" and is to be subtracted from the sextant readings as in this case the sextant has a positive reading when it should read zero. If, on the other hand, the vernier's zero lies to the right of the zero of the arc the error is said to be "off the arc" and the correction is to be added to observed angles because the instrument has a negative reading when it should read zero. It is sometimes a little puzzling to read the vernier correctly in determining an additive index correction. The vernier must be read backwards, or it may be read in the usual way and the result subtracted from the value of the entire length of the vernier in minutes and seconds, the remainder being the additive correction. The adjust-

ment of the telescope is described in paragraph 247 of Bowditch on page 94, two methods of making the adjustment being described.

The use of the sextant in nautical astronomy will be gone into at length next month, and for the present the application of the instrument to pilotage will be taken up. There are two problems in pilotage that may be readily solved by the use of the sextant and of course the ingenious navigator may put the instrument to all sorts of unusual uses in this branch of navigation. The more common of the two uses mentioned above is the finding of a vessel's exact position by means of horizontal angles between three aids to navigation or other charted objects. The horizontal angles between the objects are measured with the sextant as rapidly as possible to guard against the vessel's having moved appreciably between the taking of the two observations, or the two angles may be taken by two observers at the same instant. The angles are plotted with the aid of a protractor on a bit of tracing cloth or tracing paper as shown in Figure 5 and this paper is arranged on the chart so that the lines representing the lines of sight from the observer to each of three objects pass through their charted positions. In general only one such position of the tracing paper can be found and when this arrangement is found the position of the vessel may be pricked through on to the chart from the intersection of the three lines on the tracing paper. The "three point problem" fails to work when the three observed objects and the vessel are all on the circumference of the same circle and this condition may be recognized when the tracing paper can be arranged in a number of positions with the three lines passing through the charted positions of the observed objects. A very useful hint about measuring horizontal angles is given in Captain Lecky's "Wrinkles In Practical Navigation": when a horizontal angle is to be measured and the right hand object of the two is hard to see it is easier to turn the sextant upside down and bring the more easily seen left hand object into the silvered part of the horizon glass than to use the instrument face up, which involves picking up the almost invisible object in the silvered surface of the horizon glass. An instrument called the three-armed protractor or station pointer is described and illustrated on page 196 of Bowditch, this instrument enables the three-point problem to be very accurately solved and saves the trouble of plotting the observed angles on tracing paper. The instrument is expensive however and is rarely part of the equipment of other than large vessels or vessels engaged in making hydrographic surveys.

The other common use of the sextant in pilotage is the horizontal danger angle as illustrated in Figure 6. The horizontal danger angle may be used when two aids to navigation or other charted objects are on the same side of the channel near a submerged reef or other obstruction, and can be used to keep the vessel off obstructions at either or both sides of the channel. The problem is worked by drawing on the chart a circle passing through the two aids to navigation and clearing all obstructions on one side of the channel, say the side near the objects to be observed. If any point on the circumference of this circle be chosen and lines are drawn through this point and the two objects the "danger angle" between these lines can be measured with a protractor. The angle between the lines is called the danger angle because as long as the angle between the objects as observed with a sextant is smaller than the danger angle the vessel *must* be outside of the circle drawn on the chart and therefore out of danger. If another obstruction lies on the other side of the channel another circle must be drawn through the objects clearing this second obstruction. Another danger angle may now be taken from a point on the circumference of the second circle and as long as the angle between the objects as observed with the sextant is greater than this second danger angle the vessel is inside of the second circle and therefore out of danger. In passing between two such obstructions it is then possible to be sure that all is well if the observed angle between two objects suitably located ashore is kept within certain limits. Where a high object like a lighthouse on the top of a cliff is near a channel a device called the vertical danger angle may be used to advantage with either Lecky's or Patterson's vertical danger angle tables. The problem is of rather limited usefulness because of the rarity of high objects of known elevation near difficult channels.

Next month the subject of nautical astronomy will be commenced, the first problem to be undertaken being the determination of latitude by meridian altitude of the sun.



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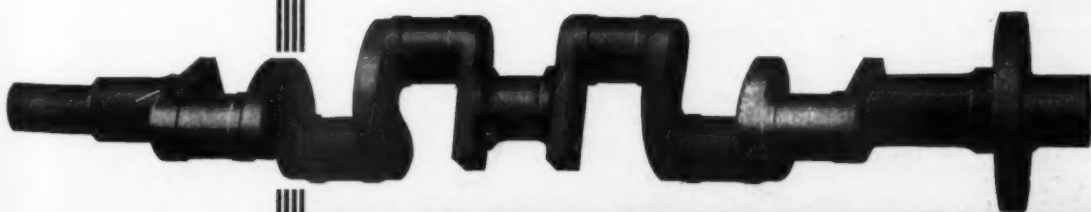
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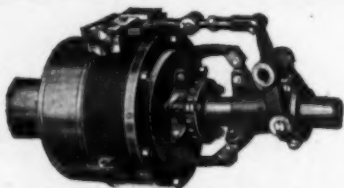
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Several Schemes Suggested

(Continued from page 54)

successful in reducing the original crook, or (perhaps due to extra enthusiasm or beef) has resulted in overcoming the original bend and introduced one in the opposite direction. Second, to use such a method of applying the pressure as will permit of gradually increasing the pressure at each attempt, so as not, as indicated above, to overdo the matter. This requirement probably will bar out any use of a hammer except in the hands of an expert, and for him this is not written. Some machine shops have presses to be used for straightening shafts, and with such an appliance the second requirement can be met by marking the extreme position reached by the screw or lever of the machine at each attempt, and a few trials will probably accomplish the result. More often, however, one must make the repair when far removed from such refined facilities as indicated above. In this case the force can probably best be applied by prying over the crook with a lever. The lever may be a crowbar or a stiff piece of timber, but in either case the point of contact with the shaft should not be too wide, not more than, say, one inch, and if an iron bar is used the shaft should be protected by a piece of copper bent around it where the bar is to bear. When prying, the shaft should be supported by blocks placed about ten diameters apart or ten inches for a one-inch shaft and twenty inches for a two-inch, and with the crook about in the center between them. Meet the second precaution noted before by putting some kind of a stop under the outer end of the lever, and which stop can be gradually lowered at each attempt until the crook is removed. If a wooden lever is used a stick nailed to the end, and which rests on the floor when the lever is clear down, can be sawed off 1/2" at a time, and will be most satisfactory. A very small shaft, say, 1/2" or 3/8", can often be straightened in a strong vise. Take three pieces of flat iron about one-half inch wide and bent at one end so they may hang on the vise jaws. Place two on one jaw at the ends and one on the other in the center. Put the shaft in between them with the crook bearing on the center piece; screw up the vise and mark the position of the screw when the pressure is fully on. After testing the shaft, if necessary repeat the operation and bring the screw up to the mark and as much more as your judgment indicates. Then rub off the old screw mark and make a new one, fixing this last position. By the observation of these suggestions and the exercise of patience you will be able to make a good job in a surprisingly short space of time.

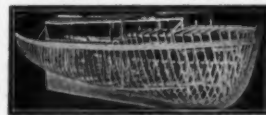
Three Separate Cases

CASE ONE—A small puncture not extending to the seams on either side of plank and within one frame space. Trim a square-cornered hole through the plank, fit a backing-piece in between the frames and extending in width sufficiently beyond the edges of the trimmed hole to allow for fastening on each of the trimmed-out holes, then fit a piece into the trimmed hole and secure with brass screws, in length an eighth inch less than the thickness of plank and backing-piece; the outside is to be smoothed off and caulked.

CASE TWO—A split plank extending over two or more frames. If there is a butt near the cracked portion, arrange to cut to this butt at one end and locate a new butt at the other end, being careful to clear surrounding butts; allow for one plank between butts of adjacent strakes and two frame spaces away for butts of adjacent strakes; after butts are located, carefully cut the new butt square across the plank; trim out the old plank and remove the old fastening, being careful not to split the frames. To obtain the shape of the new portion of plank, nail lightly a batten 2 in. wide by about 3/4 in. thick on the outside of the plank, extending beyond the ends of opening; this batten should not be allowed to bend edge-

(Continued on page 62)

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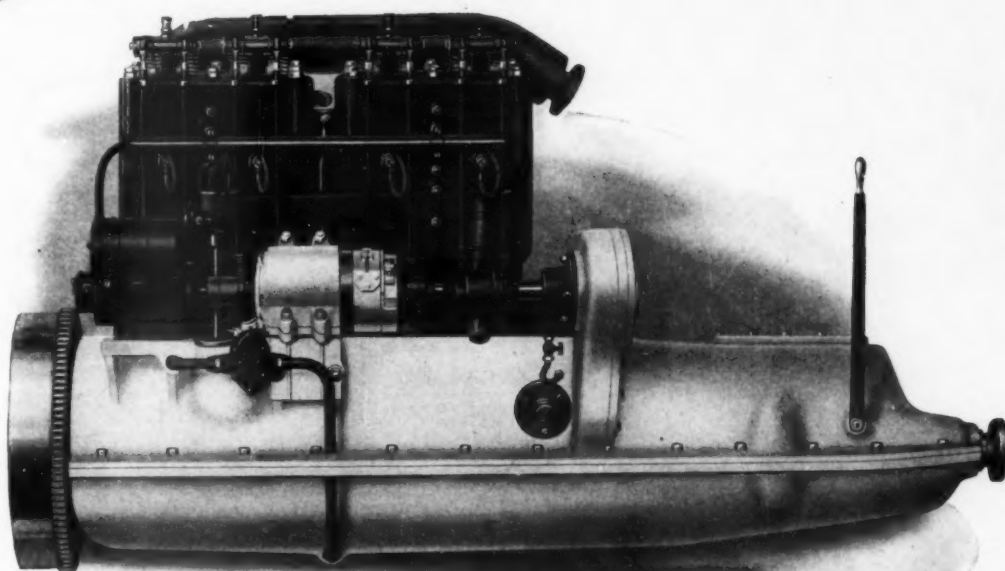
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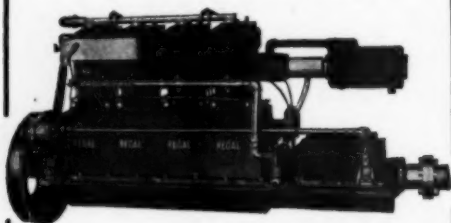
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What Ten Years Has Accomplished

(Continued from page 9)

and bookcase is often included, which is appreciated by the owner who wishes to keep in touch with his business while living aboard.

In the galley the biggest improvement is to be found in the stoves now in use. Ten years ago about the only cooking apparatus to be had was a two- or three-burner kerosene stove, or the gasoline stove which was dangerous. To-day the most popular cooking outfit is the stove using denatured alcohol. These are made with from one to four burners and also with ovens, and resemble in appearance and operation the gas stove used ashore. This fuel is clean, safe to handle, economical to use, and does not have a tendency to creep out of the tank or reservoir as kerosene does.

Some boatmen still favor the kerosene stove, but the present-day stove is far superior to those in use ten years ago. The coal stove will probably always be found aboard the larger boats and for economy and convenience when meals for a large party have to be prepared they are without an equal.

No galley is complete without a large, well-built ice-box, a sink and drainboard, a table or shelf to work on and ample cupboard space for the cooking utensils and the storage of canned goods.

Taken as a whole, the cruising motor boat is bigger, faster, more comfortably arranged and safer to operate than it was ten years ago. Much hard work has been done away with by mechanical devices such as power windlasses for raising the anchor, bilge pumps and electric starters on the engine motors, and the pleasures have increased by more reliable and more easily controlled power plants, increased speed and more comfortable accommodations for those aboard.

Runabouting!

(Continued from page 11)

turms in answer to the wheel just the same as the car.

To be sure, a boat has no brake pedal or lever, clutch pedal or gear-shift lever. The reverse-gear lever takes the place of all three as it operates the clutch and the reverse gear can be used as a brake.

The electric starter control in a runabout is exactly the same as in a car, as are also the automatic cut-out and other electrical instruments. The speedometer used on land is replaced afloat by either a tachometer on the engine or, better yet, by a boatmeter which indicates at all times the speed of the boat through the water.

The modern runabout is always electrically lighted. The system includes the sailing lights, a searchlight if necessary, a trouble lamp for the motor, an instrument light on the bulkhead and several small lamps in the cockpit. Such luxuries as an electric cigar lighter, etc., can be added if the owner so desires.

The operation of a runabout is so simple that nobody need be afraid of that part of the game. With the gasoline and oil supply aboard, it is only necessary to put your foot on the starter switch and set the motor in operation. Then with the lines cast off, accelerate the engine a little, ease in the clutch and you are off. When clear of the dock you can open the throttle and "let 'er out" to your heart's content. There is no speed limit on the water and the traffic regulations—or rules of the road as they are called afloat—are extremely simple to learn.

Derfla and Jotu

(Continued from page 13)

on our run of about twenty miles across the Bay at noon, it was blowing hard and we were broadside to the swells the whole trip. The Derfla hoisted sail which greatly increased her speed and also steadied her. The Jotu enjoyed quite a rocky voyage. However we arrived safely at Worton's Creek and were certainly possessors of enormous appetites. Our supper was delicious and consisted of innumerable quantities of the best soft shell crabs we had ever eaten, creamed potatoes, stewed tomatoes, coffee, lettuce, cake and fruit. Believe me we certainly did eat those crabs. After supper we had a dandy phonograph concert and turned in after a very pleasant evening.

Sunday

Sunday we ran back up the Elk to Randalia where we anchored for lunch. After many farewells the Derfla then proceeded to Chesapeake City. All of her crew were to take the next train to Philadelphia except Mr. Belfield and Mr. Riley who were to sleep aboard the Derfla but embark in our boat the next day for the trip up. We of the Jotu took a short trip around the Elk and spent a very nice evening chatting with some visitors from the bungalows.

Monday

We left Randalia at seven o'clock the next morning and took the Derfla contingent aboard in the canal. After breakfast Mr. Belfield took the wheel and showed us all the points of interest. I'm sure we didn't miss anything. One thing I remember however, was that while our skipper was waving to a friend we missed a concrete pier by several inches—it certainly was lucky for that pier. At any rate we arrived safely at Riverton after a very interesting trip. Here we moored our faithful craft and said farewell after the finest cruise ever.

A Favorite for Sea Work

(Continued from page 62)

Rudder ports and possible resulting leakage are eliminated in this type.

It may be truthfully said that the outboard rudder is not a thing of beauty and its appearance may not find favor in the eyes of many owners, but this fact can hardly be considered as an argument against its use on boats intended for *real* cruising.

Its most serious defect lies in the fact of its being so exposed to possible damage from other boats when lying at a crowded berth or in being injured in backing in close quarters.

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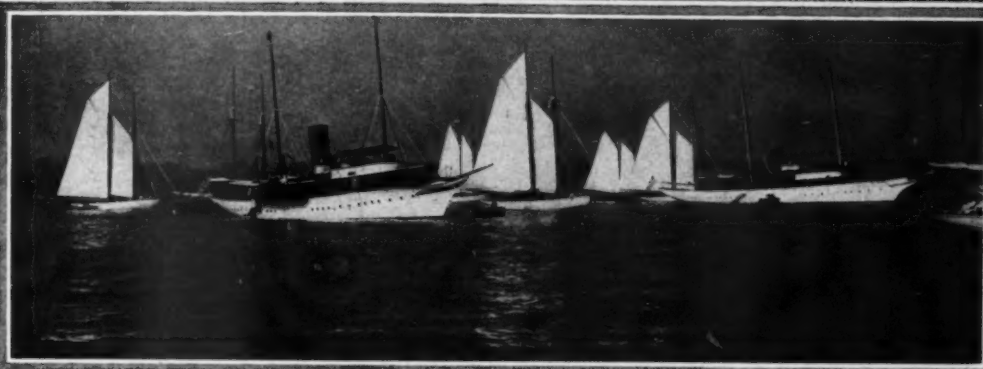
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ought to use Leatherwove for the upholstery—Leatherwove delights the eye—is beautifully finished and distinctive.

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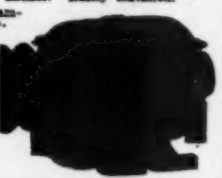
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AUTOMOBILES
ALWAYS READY
MOTOR BOATS



DAY OR NIGHT

MANUFACTURED BY
THE LEECE-NEVILLE COMPANY
CLEVELAND, OHIO

1918 Motor Boat Show

(Continued from page 35)

on the American-LaFrance motor fire engine but is equally well-adapted to use on large high-speed marine motors such as are used on express cruisers and patrol boats. The auxiliary air inlet valves are connected to gasoline dash-pots which assure a sufficient feed of fuel when the motor is suddenly accelerated.

Snow & Petrelli Mfg. Co., of New Haven, Conn., have in their space the usual line of Joe's reverse gears, one-way clutch, rear starters and other equipment for marine use. The reverse gear is shown cut open in order that the action of the parts may be seen by those interested in such a piece of equipment.

The Leeco-Neville Co., of Cleveland, O., have in their space the various electric starting and lighting devices, starter, switches, automatic cut-outs and other electrical appliances manufactured by them.

The Navy Gear Co., of New Haven, Conn., have in their booth a complete line of the Navy Marine reverse gears, some of which are cut open to show the internal workings. These gears are made in sizes for almost any marine motor.

The Knock-Down Motors, Inc., of Brooklyn, N. Y., are giving in their section a practical demonstration of the Shipmate knock-down motor, showing how easily anybody with the least mechanical ability can put one of their motors together and in that way know for a certainty when it is installed in their boat just how it should work and what its various parts are supposed to do.

The International Life Suit Corp., New York, N. Y., have their Everwarm safety suit in all sizes from that for the smallest child to the largest grown person. In addition to the suits they are showing moving pictures of their Everwarm suits in use.

The Dayton Engineering Laboratories Co., of Dayton, O., manufacturers of the various Delco electrical equipment, have in their exhibition the different starting and lighting units, ignition systems, electrical instruments, switch boards and other electrical apparatus manufactured by them.

Three Separate Cases

(Continued from page 58)

wise. At each frame, measure from the upper edge of batten to the lower edge of old plank, and mark the measurement on a line drawn across the batten in the direction of frame; also measure the width of the opening of each frame, and also mark this on the batten below the first set of figures, similar figures to be taken at each butt and marked in a line across the batten, giving the direction of butt. To be sure of the length and direction of butts, the level from opening and applied to the new plank after the edges are lined. After taking the spiling, so called, and making same on the batten or rule staff, as it is named, lay the batten out straight and flat on a piece of plank of the right thickness of necessary width and length. After spots are marked on the new plank with a small batten held in place with small nails, draw a line through the spots for upper and lower edges of plank, trim to the line and secure in place with brass screws into frame.

A Favorite for Sea Work

THE outboard rudder was one of the earliest developments of boat building and probably was the first method of making the steering gear a permanent fixture, taking the place of a steering oar, or sweep.

Most of the old-time models familiar along our coast were equipped with it, for instance, the "Pinkie," the Block Island boats, the earlier Cape Cod catboats, the Chesapeake sharpies and the government life-saving boats. These boats were all designed for hard service in open, rough waters and their steering gear had of necessity to be dependable in the last degree and capable of quick repair in case of accident.

The outboard or "barn-door" rudder, as they call it down there, is still a favorite on Cape Cod, and a boat has to be husky and capable of going out to the fishing grounds when it would seem pretty "hubbly" to the average yachtsman.

It is still, of course, in use on the boats of the life-saving service and is being adopted on many new pleasure cruisers intended for off-shore use.

Being, as it is, a development of an era in which simplicity was the keynote, it is free from many of the complexities and weaknesses of the modern steering gears and, if rigged with quadrant, leads and tiller ropes on deck and the rudder head fitted for receiving an emergency tiller, it is hard to imagine a boat remaining long disabled from defective steering gear.

Bear in mind, also, that a spare rudder can easily and conveniently be carried, and is easily shipped, under any except the worst conditions.

(Continuation on page 60)

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for motor boats, cruisers and motor ships are carried in stock by leading dealers everywhere.

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YOU would get double the service and double the pleasure from your boat if you had it properly equipped for use after dark. Picture an evening in midsummer, cool and dark, after the heat and glare of the day. Imagine the smooth water, the twinkling lights, the distant sounds that come over the water. What could be more alluring?

With all its attraction, boating at night is uncertain and unsafe unless you have a powerful searchlight, for avoiding rocks or driftwood, for picking up points on shore, recognizing other boats, making landings, finding your mooring or any similar use, the searchlight is indispensable. That is why you need a

Golden Glow Searchlight

A mirror reflector of special yellow glass gives the peculiar light which is the exact shade of molten gold. This reflector cannot be duplicated because it is patented. It is non-tarnishing and non-corroding,—heat proof, water and weatherproof.

Golden Glow Searchlights are made in great variety for all sizes and types of boats, from a little launch to an ocean liner. Any practical voltage or candlepower.

Golden Glow Searchlights are made especially for marine use. Their exclusive feature, the fog-penetrating golden yellow light makes them the most powerful and practical searchlights for motor boats, cruisers and yachts.

Optical science has discovered the superior value of yellow light. It is glareless, easier on the eyes, gives more distinct vision of distant objects, penetrates fog and mist, and with equal candlepower will carry further than white light or any other color.

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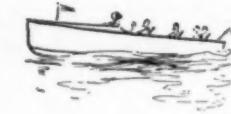
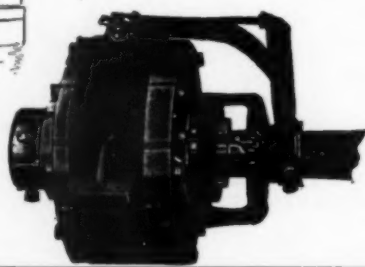
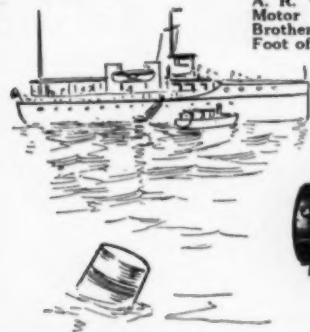
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Are light, at the same time strong; accomplished by using semi-steel castings, high carbon steel shaft, bronze bearings, high class workmanship.

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How Uncle Sam's Birdmen Learn To Fly

(Continued from page 41)

completed, the cadet receives his commission in the branch of the service for which he has been trained. He is not yet ready to meet the enemy. No amount of advanced acrobatic and squadron formation work in the American field will fit him.

He is, however, ready for still more advanced flying back of the battle lines in Europe, where he will receive most careful instruction under the direct supervision of those who are already famous for their contributions to war-time aeronautics.

The romance and adventure of the air, and of aerial warfare have called to the young manhood of America, and our young manhood has answered with a readiness and a will. The unlimited field of individual effort offered make this the most popular branch of the United States service.

To some it may seem that the reward is not equal to the effort, but such opinion finds no sympathy with our birdmen. Uncle Sam demands of the air service a great deal, but gives those who meet his requirements all that heart can wish in opportunity, adventure and promotion.

Clearance and Propeller Extra Bearings

IT IS impossible entirely to eliminate vibration in motor boats, but with care in design and good sound construction it may be greatly minimized. The primary causes of vibration may be classified as follows:

(1) The engine, (2) propeller, (3) shaft, (4) large deadwood.

1. In a single-cylinder engine the explosion occurs every 2nd or 4th stroke, according as the engine is of the two or four-cycle type, so that the turning moment applied to the shaft is intermittent. There will always be more or less vibration from this cause, although the fly-wheel does a great deal to lessen it.

2. An improperly balanced propeller, turning at high revolutions, will set up a strong centrifugal force and will cause vibration. When propellers are cast from a one-blade pattern it may easily happen that all the blades are not of exactly the same pitch, and consequently will work at different slip ratios. Thus each blade will deliver a different thrust and will cause vibration.

Two-cylinder motors vibrate less than single-cylinder machines, and, since the power impulses are more evenly distributed, a three-cylinder is steadier than a two.

It is always advisable to have the shaft as nearly horizontal as possible, and in order to do this, the tips of the propeller blades are sometimes allowed to come too close to the hull. The distance between the tips and the hull should never be less than one inch. If it is less, the flow of water to the blade nearest the hull is restricted and the torque thereby reduced. The torque is then not symmetrically applied to the propeller, with the result that there is a reaction on the strut, and consequently vibration.

With a large angle of shaft each blade will work at negative slips at one portion of the revolution and at excessive slips at another portion. Thus the thrust delivered by each blade will vary tremendously and the boat will vibrate.

3. To obviate vibration in boats with a long shaft, there must be a sufficient number of bearings to keep the shaft from whipping. A whipping shaft will soon slacken the strut or the engine bed-bolts and thus cause vibration. This is seldom considered of great importance on small boats, but in many cases it is very important. In order to eliminate vibration from this cause the length of unsupported shaft should never be less than that given by the curves for solid bronze shafts.

4. In boats having a thick deadwood with the propeller close to it, every revolution, each blade in turn is partially masked, and is momentarily working on dead water. The result is, that the thrust is suddenly diminished when the blade enters this region, and is as suddenly increased when it leaves it. These rapid variations in thrust give rise to very unpleasant vibrations. It will be readily seen that the way to eliminate vibration from this cause is to taper the deadwood.



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No. 1 Preservative

The perfect interior finish for boats, yachts and steamships. Not harmed by hot water and soap.

Waterproof Floor Finish

The perfect floor varnish for marine use.

Write today for copy of our valuable booklet, "What to Use and How to Use It." Gives many important suggestions for the selection and application of varnishes for different purposes. Sent free on request.

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Varnish Makers Since 1868

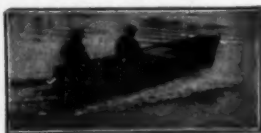
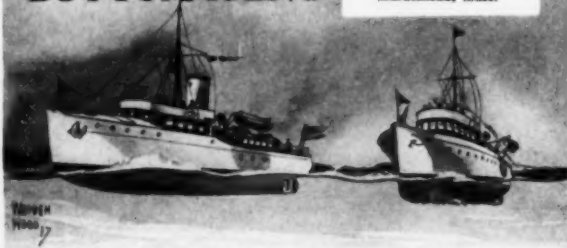
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ANTI FOULING
GREEN
BOTTOM PAINT

FOR STEEL
OR
WOOD
STAYS CLEAN

Gives the greatest efficiency with the smallest fuel consumption. Semi-enamel white for topsides. Stearns-McKay Mfg. Co. Marblehead, Mass.



Valley Boats

Combine Efficiency
and Satisfaction

"SAND-DAB," 16½' long, 4½' beam, 11" draft. 4-cylinder, 4-cycle motor housed in amidships giving range of speed from a trolling speed to 12 miles per hour.

Write for list or come and inspect our new and slightly used boats which are ready for immediate delivery. See our 45-mile Hydro Runabout and 35 ft. Double Cabin Cruiser.

Let us help you plan your boat for use in Southern waters. We have many attractive designs and now is the time to get started. VALLEY boats are Quality boats—up to the minute in design and having the finest of materials and workmanship.

Cruisers, Runabouts, Hydroplanes, Rowboats

Valley Boat Company, River St., Saginaw, Mich., U. S. A.

WHITE FOR SAFETY
"RED SPOT" SEARCHLIGHT
RED FOR DISTRESS



MOST PRACTICAL MOTOR BOAT SEARCHLIGHT MADE

WHITE FOR SAFETY—for navigating dark and unfamiliar channels, avoiding rocks, picking up buoys, making landings, etc. A powerful penetrating light that carries far and insures safety at night.

RED FOR DISTRESS—simply press a button and produce a brilliant red light that is as effective as red fire for a distress signal and is visible for miles.

The Red Spot can be operated on regular lighting system, storage or multiple dry battery. Diameter 5¼", height 10". Easily removed from base for stowing away.

No. 1615 Red Spot Searchlight complete with 6-8 volt lamp, weatherproof cord with copper terminals attached. **\$6.50**

Order a "Red Spot" through your dealer, or direct from us. We also manufacture running lights and cabin brackets.

The F. W. Wakefield Bras Co.
118 Water Street Vermilion, Ohio

Cruising Comfort
—a graceful, sturdy craft that ploughs the sea with perfect ease and limitless power; grips the water tenaciously yet glides along without lost motion, entirely free from toss of tempest or "whip" of wind.
Completely able and supremely sea-worthy—a pride and pleasure every knot of the trip, bringing you safely home with keen anticipation for the next cruise. That's the story of
Richardson's Boats
Built to order from your plans or our designs, as you prefer. Full of comfort and character—"A Country House Afloat."
Everything in boats from E/D to complete outfit. If quality counts with you, write us. You'll like our complete story.
RICHARDSON BOAT CO.
North Tonawanda, N. Y.

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Advertising Index will be found on page 110

LOST—A Brand New Boat!

Many a new boat has hit the rocks because of an unreliable compass. In a sudden fog or when cruising in unfamiliar waters, blind steering may mean disaster.

OIL COMPASS



Points true—is sensitive and accurate in any climate. Built especially to withstand the jars of power craft. Carefully tested and fully guaranteed. Sizes of dials 2, 2½, 3, 4 and 5 inch. Ask your dealer, or write us.

FREE BOOKLET—"Compass Talk and Tests," containing practical information and tables for recording deviation.

Est. 1847

World's Largest Marine Hardware Manufacturers



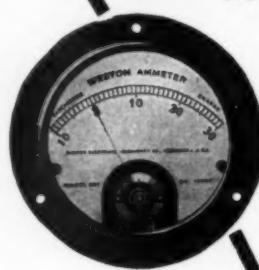
**WILCOX, CRITTENDEN
& COMPANY, INC.**

Trade
Mark
Reg.

4 S. Main Street, Middletown, Conn.
Mfrs. of the Famous Maxim Motor Boat Silencer

Lights Out at Night!

It might happen in midstream. This is the risk you run when you have to guess at the power supplying your electrical equipment. But if you install a



Weston
Model 301 AMMETER
On Your Bulkhead

You can tell exactly, and at all times, the rate of charge or discharge of the battery. You know before it is too late whether your battery is being maintained in the condition which will assure you perfect service.

Write us—let us tell you about it.

Weston Electrical Instrument Co.
28 Weston Avenue, Newark, N. J.
23 Branch Offices in the Larger Cities

ROBERTS MOTORS

We build a complete line of motors, marine, aircraft and stationary. We have the right motor for your boat at the right price.

For a Heavy Duty Fisherman's engine that will stand the hardest kind of service, take a look at this Roberts Motor. It is a wonder for power, strength and dependability.

The Bore is 6", stroke 6½", developing 8 H.P. at 300 R.P.M. and 10 H.P. at 400 R.P.M. Operates on either gasoline, kerosene or distillate. Furnished with either Jump Spark or Make-and-Break Ignition.

Write today for prices, specifications and blue prints.

Roberts Motor Mfg. Co. 1205 ROBERTS BUILDING
SANDUSKY, OHIO

Our MARCH ISSUE—our annual FITTING OUT NUMBER INSTEAD OF APRIL

Our readers state that more time is desired to study fitting-out plans than the April issue affords. Our editors therefore have planned to issue the best Fitting Out Number ever in March. Advertisements will be given longer and better attention.

Tell your complete advertising story.

**MoToR
BoATIng**



THE FLAG SIGN that Guarantees SERVICE

The flag of the Vikings—The Raven—was the first flag brought to this continent.

The flag of Betsy Ross—Thirteen Stars—was the first flag of our country. This sign on a flag means the ambition of the pioneer and the honest purpose of our forefathers in flag construction, workmanship and quality. It will pay every user of good flags to remember this sign when purchasing—a real guarantee of quality and satisfaction.

Not only is it the most serviceable flag for the Yacht and Power Boat owners, but for any purpose for which a flag is used.

We are makers for the Army and Navy—our experience and facilities embrace special designing for trade-marks and private use—Merchant Marine flags, Signal Flags, etc.

If you have any kind of flag requirements, write us at once—prompt information and economical prices.

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NEWBURGH, N. Y.

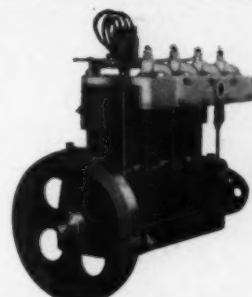
NIAGARA
The Complete Boat

Combines custom-built luxury with the economy of ready-made production, promptness of delivery and standardization of parts.
Write for literature.
NIAGARA MOTOR BOAT COMPANY, 210 Sweeney Street, N. TONAWANDA, N. Y.

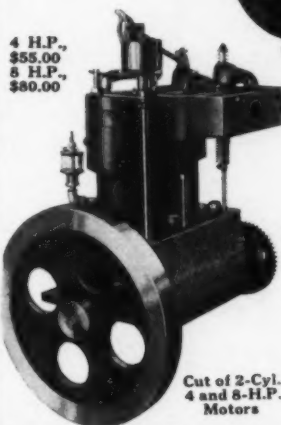
Dunn 4 Cycle Motors

Can be operated on either kerosene or gasoline.

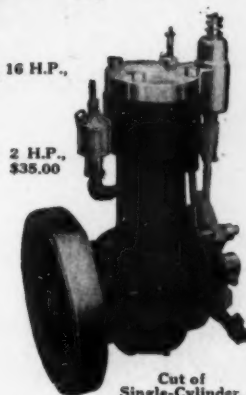
We make a specialty of popular priced motors whose working parts are as well made as the highest priced engines.



Cut of 4 Cylinder, 16 H.P., \$135.00.

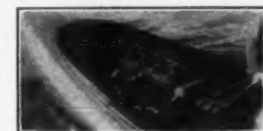


Cut of 2-Cyl., 4 and 8-H.P. Motors

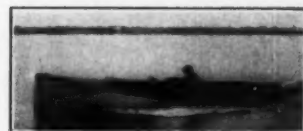


Cut of Single-Cylinder, 2-H.P.

2 H.P., \$35.00



An Installation.



Dunn Powered Launch.

Send for Catalogue
We sell direct from
factory to user



The Dunn Factory.

The Dunn Motor Works
Ogdensburg
New York, U. S. A.

The Most Practical Motor Boatman's Book Ever Published

It is full of new and practical information about boat handling, navigation laws, lights, buoys, compasses, piloting and a thousand and one other helpful hints that will be invaluable to you.

"Practical Motor Boat Handling, Seamanship and Piloting," handsomely bound in cloth, is selling throughout the country at \$1.00 per copy.

For Sale at All Booksellers, or

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The pleasures of boating are enhanced by the feeling of Security one enjoys if your Craft is protected by *GOOD WOOLSEY PAINT and VARNISH—TOP and BOTTOM.*

WOOLSEY COPPER PAINTS

AND

MARINE PAINT SPECIALTIES ARE THE WORLD'S STANDARDS

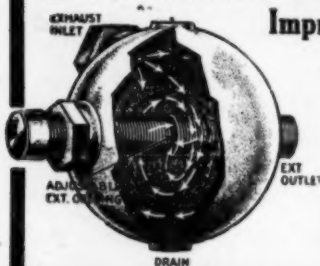
Copper Paints—Brown, Red and Green, Yacht White, Deck Paint, Marine Mixed Paints, Metal Bottom Paint, Seam Paint, Seam Compounds, Sparon (Spar) Varnish, Engine Enamels, Canoe Enamels, Boat Bottom Seam Compound, etc., etc.

C. A. WOOLSEY PAINT & COLOR CO., Jersey City, N. J., U. S. A.

Send for our Marine Booklets, Free—Contain Color Spots and information "How to Paint a Boat."

Silence!

The law compels you to have an effective silencer on your boat. Many boat owners think they are beating the law by conducting the exhaust under water or some other complicated method, but it is a fact that they lose more in power and wasted fuel due to the back pressure than the cost of an



Improved Thermex Silencer

The Improved Thermex increases your revolutions and saves fuel because it absolutely eliminates all back pressure. It silences the noise of the exhaust by cooling the gases with water and provides for their gradual expansion to atmospheric pressure. Cannot clog, nor collect salt; water cannot flow back to cylinder. No heating, no odor. Used free or under water—adjustable discharge. Lightest, best and cheapest to install. Write today for descriptive booklet and prices.

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Life Preserver Jackets

This garment is warm and can be worn at all times with perfect comfort. Its value is proven by the fact that thousands of them are being put in use by our Government. One of its strong points is the buoyant collar that supports the head and prevents drowning, even though the wearer becomes unconscious. **YOU CAN'T DROWN!**

Everyone traveling on water, whether for business or pleasure, should provide himself with one of these moderate priced garments.

We also manufacture Auto Boat Tops, Spray Hoods, Life Preserver Cushions, Hair Cushion, Spring Seat Cushions, Upholstery, Draperies, etc.

Write for prices.

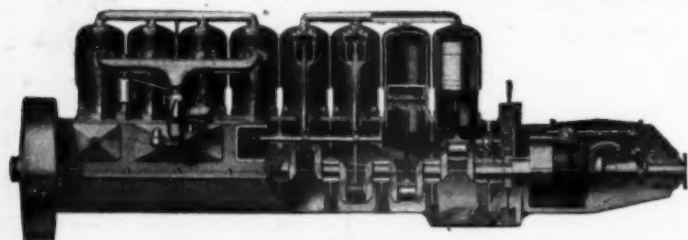
G. H. MASTEN CO., Inc.
222-226 E. 46th St., New York City



FINISHED CRANK SHAFTS

P. H. GILL & SONS FORGE AND MACHINE WORKS, BROOKLYN, N. Y.

We are furnishing them to some of the leading marine engine builders. Carbon and Alloy Steel, Heat Treated to your own specifications. We grind all Pins and Bearings. Forged, machined, and finished complete in our own plant. Let us quote you.



NIAGARA MOTORS

Four Cycle Type. 5 to 200 Horsepower. Made in 2, 4, 6 and 8 Cylinders. For Cruising, Racing, Fishing, Freighting

Smooth, well-balanced and symmetrical in design, powerful and thoroughly dependable in operation, they are the embodiment of the best engineering effort.

OVER 11 YEARS' SUCCESSFUL SERVICE THROUGHOUT THE WORLD. The strongest possible guarantee by a company thoroughly responsible, financially, stands behind every NIAGARA. You will never regret it if you

PUT THE POWER OF NIAGARA IN YOUR BOAT.

NIAGARA MOTORS CORPORATION

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BUFFALO, N. Y.

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TEXACO
Gasoline and Motor Oils

Preservo
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Waterproofs and Preserves Canvas
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THE HUNTER-JOHNSON CO., 311 California St., San Francisco, Cal.
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STANDARD OIL ENGINE SEMI-DIESEL

A strictly heavy duty engine, for tow boats, freight boats, auxiliaries and large cruisers.

4 Cycle—5 to 250 H. P.—One to Six Cylinders
Write for further details.

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Works: Bridgeport, Conn.

YACHT CARPET

Established 1849

LOUIS DUSENBURY & CO.,

229-233 Fourth Ave., N. Y. City

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TOPPAN-BOATS

NOTICE

On account of Government orders we find it impossible to exhibit 6 to 8 Boats as usual at the New York Show. We expect, however, to exhibit our new 22 ft. x 6 ft. Beam Dory from specifications of the Coast Guard officials. This Coast Guard Standardized Model is the best Rough Water Boat built and will be added to our regular line of Power, Sail and Rowing Dories and Launches.

TOPPAN BOAT MFG. CO. Medford, & Boston, Mass.



Never-Leak Tanks

for Storing Gasoline Water Air or Oil

A "Safety-First" Tank for Motor Boats and Yachts

"Never-Leak" Tanks are made of one length of suitable gauge sheet steel, with heads and tappings welded in the shell. Galvanized thoroughly inside and outside after tank is made up, insuring an even, unbroken coating.



Welded construction throughout. A large stock on hand for immediate delivery.

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SILENT VALVE DRIGGS

A Marine Engine which combines
Silence
and
Power

Incorporates a silent and thoroughly efficient rotary valve which is always gas tight and silent and can never stick.

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WE can save you time and money on Towing, Weedless, and Reversible Propeller Wheels, Reverse Gears, Universal Joints, Rear Starters, Underwater Exhausts, and a hundred and one other motor boat accessories.

We manufacture the best line, and they give the best results, at prices right. Send today for our large free catalog.

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HEINZE

High Tension Magneto
Original in Design
Superior in Quality.

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HEINZE ELECTRIC COMPANY

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Patented

Best
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Lowest
Cost
All Types
in Stock

Price, \$40
Complete

Self-Locking
STEERERS

Effect great economy in use. Positive control — no back lash installed in DISTURBER IV

We also manufacture All Cast Bronze Concealed Wire Searchlight with Patented Control Rope Steerers Marine Fittings

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Chicago, U. S. A.

WICKER-KRAFT

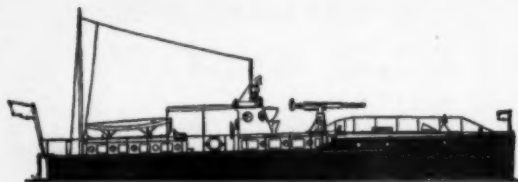
YACHT FURNITURE

The original wicker yacht furniture. Unexcelled in design, workmanship, finish and durability. Regularly used by the finest boat builders, including Lawley, Seabury, Luders, Elco, Great Lakes, Albany, Niagara, Fay & Bowen and others.

The popular idea of enclosing a life preserver under the seat of the chair is an original Wicker-Kraft feature.

Write for illustrated catalog and prices.

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H. G. PRATT, Prop.,
Newburgh, N. Y., U. S. A.



ANNOUNCEMENT

THE LUDERS designs for a 65-foot express cruiser of Coast Defense type has been accepted by the United States Navy Department as the Best Type of all Designs submitted by the Leading Naval Architects of the country.

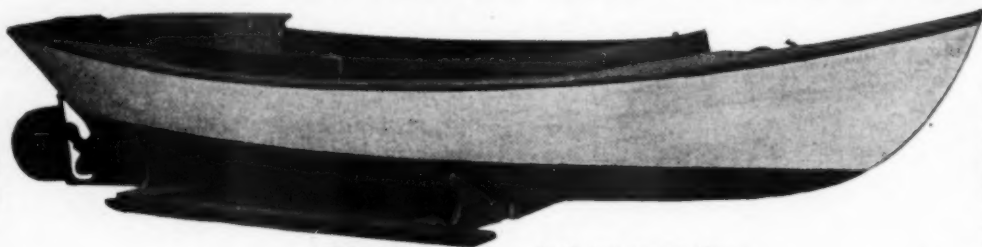
We are prepared to accept orders for Duplicates from Yachtsmen who will appreciate what this achievement means.

LUDERS MARINE CONSTRUCTION CO.
STAMFORD, CONN.

DON'T BUY A BOAT

UNTIL YOU HAVE SEEN THE EXHIBIT OF CAPE COD BOATS

The Best
Little
Sea Going
Boat Built



Rides the sea like a duck but never dives.

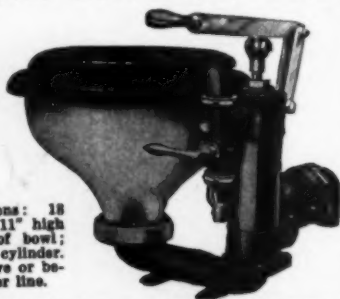
CAPE COD POWER DORY CO., Office and Factory, Wareham, Mass.

A FEW STOCK MODELS

- 20' Dory Launch
- 17' Sail Dory
- 16' Shallow Draft
- 17' Launch
- 21' Runabout
- 14' For Outboard Motor
- 10' Row Boat
- 12' Row Boat
- 24' Cabin Cruiser
- 30' Cabin Cruiser

IMPROVED MOTOR BOAT CLOSET

Figure 1404



Dimensions: 18 x 18 x 11" high to top of bowl; 2 1/2" cylinder. For above or below water line.

The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

All prices subject to market advances, which are continually changing.

Price\$25.00

THE J. H. CURTISS CO.

The J. H. Curtiss Co. Pioneer Specialists in Marine Sanitary Fixtures

Since our advertisement appeared in the first issue of *MoToR Boating*, December, 1907, hundreds of Curtiss fixtures have been installed in motor cruisers and yachts of all sizes, including some of the finest boats launched within this period.

The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

With Pump

Lining and Fixtures Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

No. 5

Height, 19 inches.

Width, 19 inches.

Depth Closed, 6 inches.

Quartered Oak Case, Each...\$42.50

Mahogany Case, Each..... 44.00

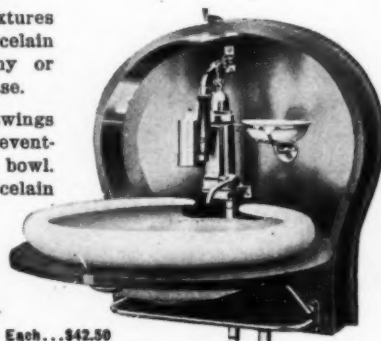


Fig. 1392

2 South Street, New York

20th CENTURY Gasoline Motors

2-Cylinder—6 1/2" x 8 1/2"—15-20 H.P.—400 R.P.M.

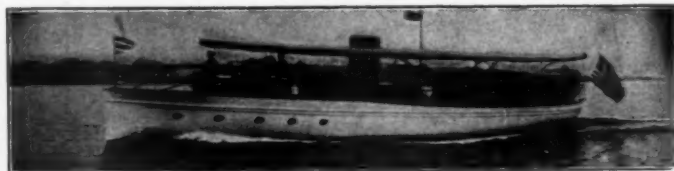
4-Cylinder—6 1/2" x 8 1/2"—40-50 H.P.—400 R.P.M.

6-Cylinder—6 1/2" x 8 1/2"—65-75 H.P.—400 R.P.M.

Strictly high grade four-cycle engines, built for heavy duty service.



NEW YORK YACHT, LAUNCH & ENGINE CO.



65 ft. x 14 ft.—JINETTA—J. H. Becker

Most yachtsmen know of the satisfaction given by yachts designed, built and powered by us; our experience is at your command; plans on file of all size yachts.

Send Us Your Inquiries

Morris Heights, New York City

Your Motor- "LUNKENHEIMER Equipped"



Is a safeguard against those vexatious experiences which break operating schedules and spoil the pleasures of motor boating.

Each device of our extensive line is a practical design, durably constructed; and will give continuous satisfactory service with the greatest safety and economy.

The best boats everywhere are "Lunkenheimer-equipped."

Your local dealer can supply you; if not, write us.

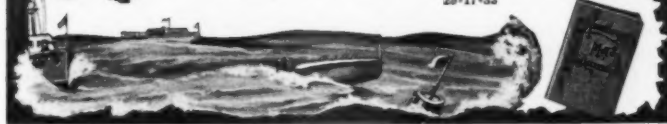
THE LUNKENHEIMER CO.
"QUALITY"

Largest Manufacturers of
High Grade Engineering Specialties
in the World
CINCINNATI
New York Chicago Boston London



Write for
Catalog
No. 4-CC.

25-17-33



POWER

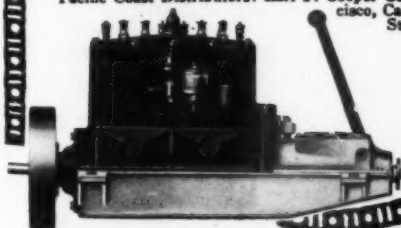
Wisconsin Motors are known for their ability to get maximum power out of every gallon of gasoline. Quiet, smooth running, light and compact, they are the product of the highest type of engineering skill.

Wisconsin Motors

for marine use contain those same qualities that have made Wisconsin Racing Motors champions of the world on road and speedway. If it's a Wisconsin it's a consistently dependable motor.

WISCONSIN MOTOR MFG. CO.

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New York Branch: 21 Park Row, T. M. Fenner, Factory Representative.
Pacific Coast Distributors: Earl P. Cooper Co., 1428 Bush St., San Francisco, Cal., and 1310 So. Los Angeles St., Los Angeles, Cal.



Four, six
and eight
cylinder types.
Write for
specifications.

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"NORMA" BALL BEARINGS

(Patented)

The "nerve centers" of the boat or engine—so may be defined the ignition and lighting apparatus. Weakness, inadequacy at these centers reacts throughout the machine. Failure at these points means a failure of all the nerve-controlled functions of the boat. Can a boat, engine, or man show "stamina", with an inherent weakness at the nerve centers?

"NORMA" Ball Bearings, by their superlative speed qualities and proved serviceability, contribute mightily to the rugged strength and service capacity of those high-grade magnetos and lighting generators which are the "nerve centers" of all boats and engines of proved dependability.

Be SURE. See that your Electrical
Accessories are "NORMA" Equipped.



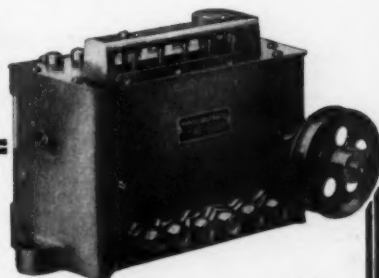
THE NORMA COMPANY OF AMERICA

1790 BROADWAY

NEW YORK

BALL, ROLLER, THRUST AND COMBINATION BEARINGS

Oil Is Cheaper Than Engines



A cent's worth of oil at the right place would often save ten dollars' worth of repair work. Perhaps you have never failed to supply the oil, but your responsibility to your engine does not end until you have provided the surest possible means of getting that oil to the right place, at the right time.

Manzel Forced Feed Oilers

furnish the most dependable system of lubrication known. They can never fail because the oil is forced through each

feed under pressure by a powerful pump which is driven by the engine itself. Manzel Pumps are made in a complete variety of sizes and styles, from one to fifty feeds, to fit every kind of marine engine manufactured. Any style of drive.

Write today for copy of this free booklet on lubrication. You'll find it well worth reading.



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356 Market Street

DURKEE'S
HARDWARE



FOR WET
PLACES

VISITORS TO THE MOTOR BOAT SHOW

are cordially invited to make use of the

DURKEE BOOTH

No. 92, Mezzanine Floor

DURING WEEK OF MOTOR BOAT SHOW

WE WILL HAVE A DISPLAY OF

MARINE HARDWARE and SPECIALTIES

At 2 & 3 South Street

Fifteen minutes from Motor Boat Show by Subway at 42nd Street or by the Elevated R. R. Third Avenue at 47th Street Station.

CHAS. DURKEE & Co.
D. Inc.

Manufacturers of MARINE HARDWARE and
MOTOR BOAT SPECIALTIES

2 and 3 South Street

New York

Manufacturing Plants

Brass and Galvanized Goods, Grasmere, S. I., New York City
Machine Shops, Mop, Broom and Flag Factories, New York City
Send 25c to cover delivery 1000 page Catalog or thru your dealer free.



THE JASCO TANK

Is an absolutely leakless carrier for gasoline. It is made of the finest quality steel, is seamless, tinned and tested and is made in styles and sizes to suit any type of motoring craft.

It prevents accidents due to leaking gasoline and gives you the use of every drop of your fuel. Look into the proposition of "Safety First" as applicable to your boat.

Write for detailed literature. We will be pleased to send it to you together with our full color marine signal card.

JANNEY, STEINMETZ & CO.

Main Office: PHILADELPHIA

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The Light that never Fails

HENRICKS

EUREKA

Lighting Outfits for Motor Boats

THERE'S one thing about these lighting outfits of ours—they're built to give you even more service than you expect. They serve a double purpose—light and ignition—both important and both sure with Henricks back of them.

These Outfits must do all that we say they will and be all that the name Henricks stands for—Quality, Service, Economy.

Get our booklet—there's a Henricks outfit made for your boat.

Henricks Magneto & Electric Co.
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244 California St., San Francisco, Calif.

HYDE

TURBINE TYPE PROPELLERS

Used by the Gold Challenge Cup Winners

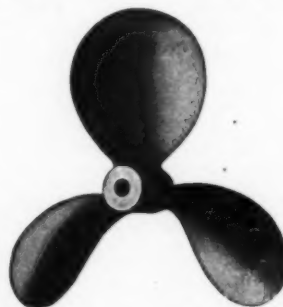
1914—BABY SPEED DEMON II

1915—MISS DETROIT

1916—MISS MINNEAPOLIS

1917—MISS DETROIT II

Forming a Remarkable Record for Efficiency and Consistent Performance



Catalogue and Prices Free Upon Request.

HYDE WINDLASS COMPANY
BATH, MAINE, U. S. A.

Do It Better!

—Our Aim for Seventy Years

Today Time and Deep Sea Service have stamped our line "DEPENDABLE." It pays to say **W** to your dealer. You buy Quality and Service with it. There's a "margin of safety" in **W** Goods that appeals strongly to experienced yachtsmen.

Single-Post AUTO STEERER

A lower priced Auto Steerer. Similar in construction to other Steerers of the same type, but bears that skillful workmanship always characteristic of the **W** Line. Model M is equipped with Spark and Throttle Controls, wooden drum, 3 spoke spider, laminated maple rim stained imitation mahogany. Well and accurately made. Specially recommended for small boats. Still making Auto and Bridge Deck Steerers for runabouts, autobots and cruisers. Strong, easily operated. Solid brass steering post inside outer tubing; safe, convenient. Spark and Throttle Controls built in the Steerers; both levers inside the wheel. Furnished with Rack and Pinion, Drum, or Drum and direct Spark and Throttle Controls.

It Pays to Buy
Our Kind

Established 1847

Mfrs. of the Famous Maxim Motor Boat Silencers



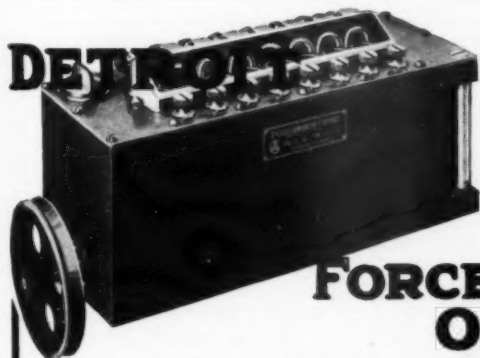
GET THIS
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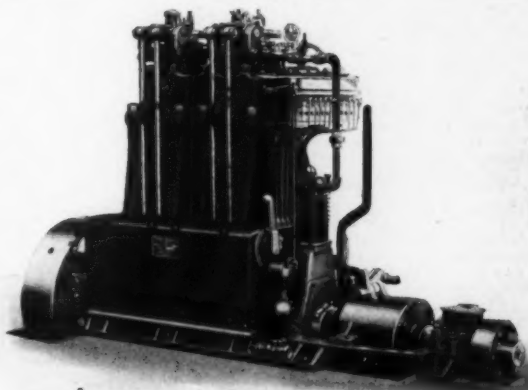
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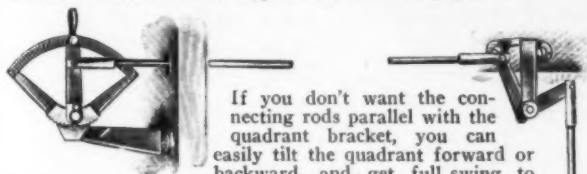
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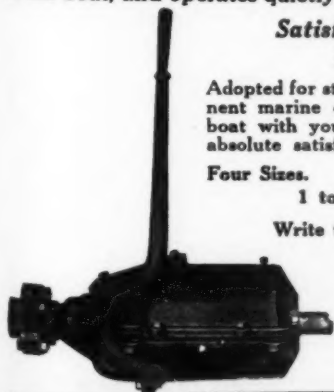
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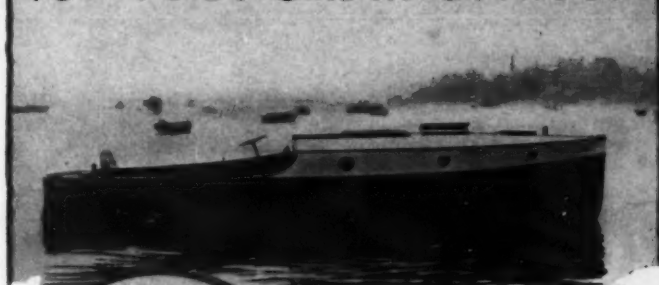
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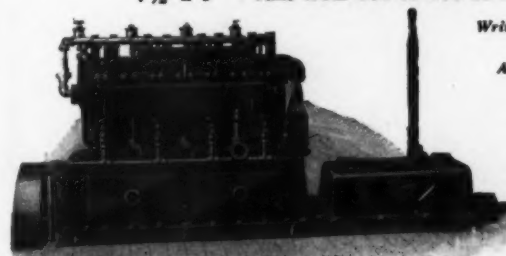
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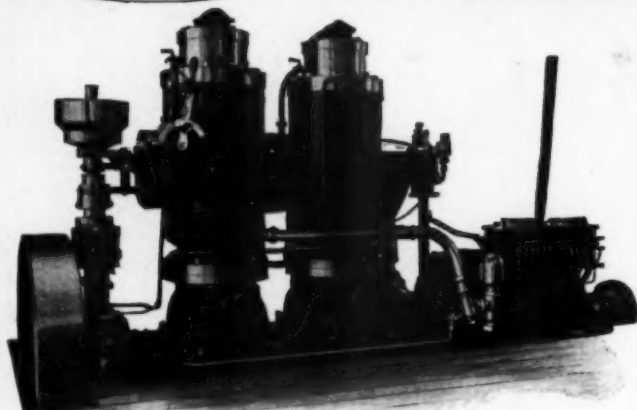


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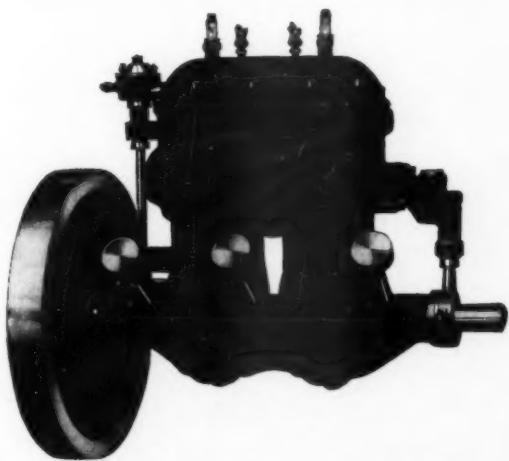
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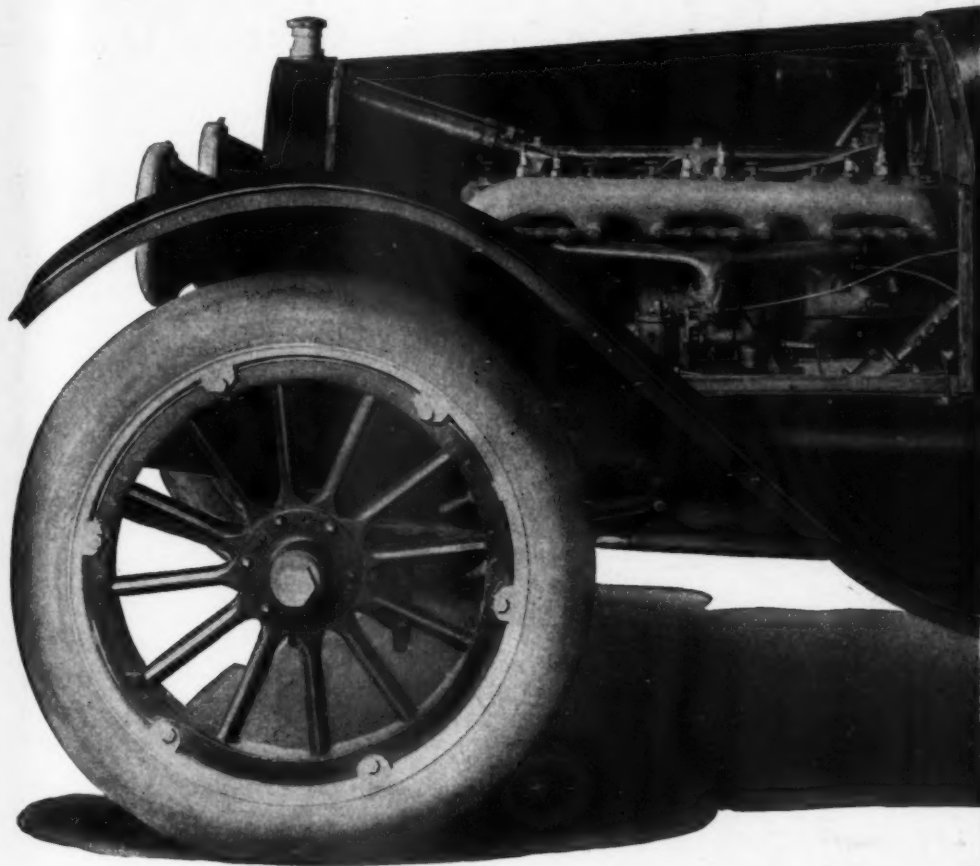
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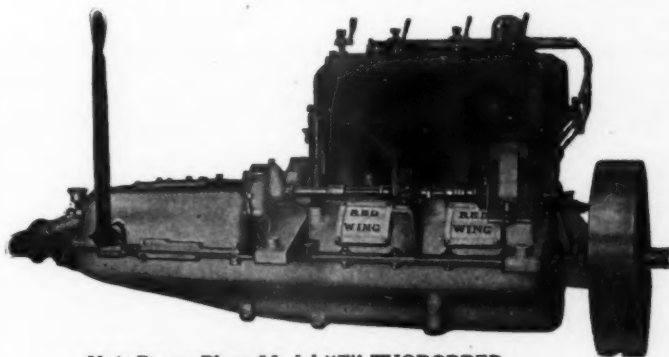
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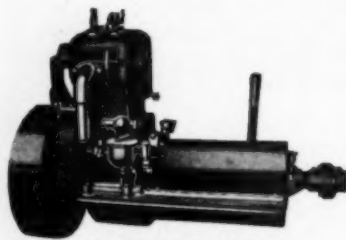
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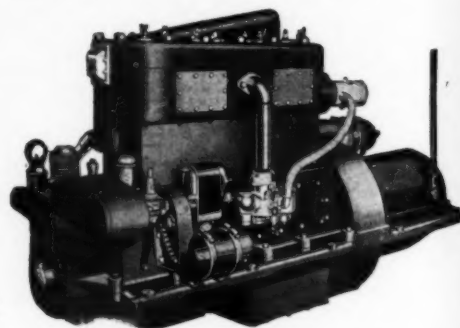
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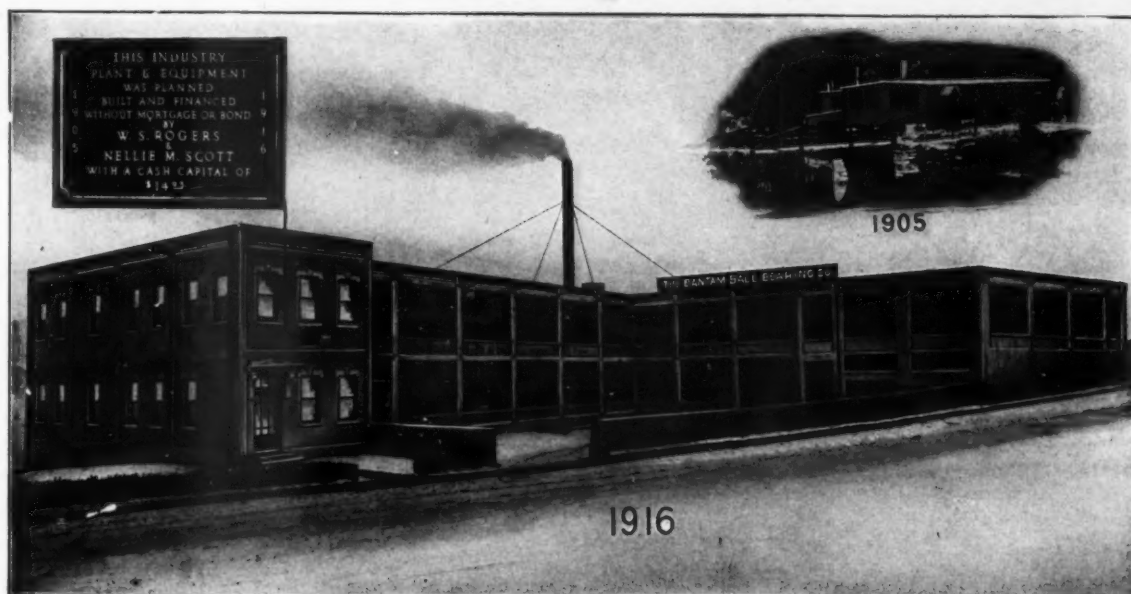
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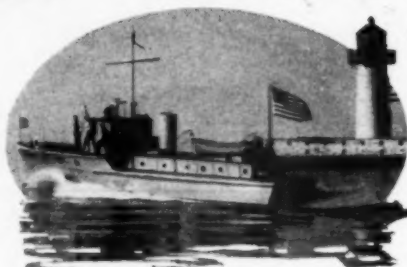


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50 Madison Street

La Porte, Ind.

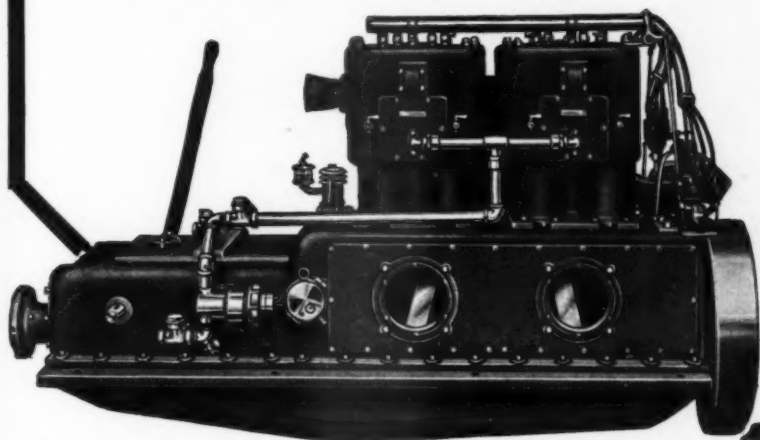
**For Working Boats
and Heavy Cruisers**

GRAY-PRIOR
FOUR CYCLE
MARINE MOTORS
Built up to a Standard—not down to a price

36 H. P. Medium Heavy Duty

Here is a high grade medium heavy duty, long stroke four cycle motor that will do your work with less expense, bother and trouble than you have ever thought possible. We have not tried to see how cheaply we could build it, but we have tried to see how reliable and efficient we could make it.

This Model D-4 GRAY-PRIOR motor has a bore of $4\frac{1}{2}$ inches, with 8 inch stroke. It develops 36 H.P. at moderate speed, and it will continue to develop 36 H.P. for 10 hours, 100 hours or as long as you happen to need it. We have put into this Model D-4 the best fruits of our 17 years' experience in engine building and can conscientiously recommend it as the ideal power plant for heavy cruisers and commercial boats.



Just a few of the Features

Two Complete and Separate Ignition Systems—Two sets of Plugs—Diameter of all Crank Shaft Bearings one-half of cylinder bore—Planetary Reverse Gear Giving Same Speed Reverse as Forward—Pressure Feed Oiling System to all Bearings and Working Parts, Including the Reverse Gear.

Write for complete specifications and prices.

We also build the famous HARTFORD 2-Cycle Motors. Model X Type. Heavy Duty Type.

**The Gray & Prior Machine
Company**

56 Suffield Street, Hartford, Conn.

Because of the fine record on the construction of its quota of 110-foot submarine chasers, the Matthews Boat Co. has been especially complimented by the United States Navy Department. The boats were splendid examples of hull building, and what is more important to the Government and the nation, THEY WERE DELIVERED ON TIME.

To complete in record time, a contract taxing the entire capacity of the plant, is the acid test of a business organization. But speed and efficiency are built into the Matthews business, just as much as the far-famed quality of Matthews Craft.

The Matthews Boat Co. has the facilities and equipment to build a limited number of hulls for commercial service quickly and economically. Tugs; Barges for canal, lake and coast-wise trade up to 200 feet; Auxiliaries; Ferries; Fishing boats.

**MATTHEWS
CRAFT**

"QUALITY WITHOUT
EXTRAVAGANCE"

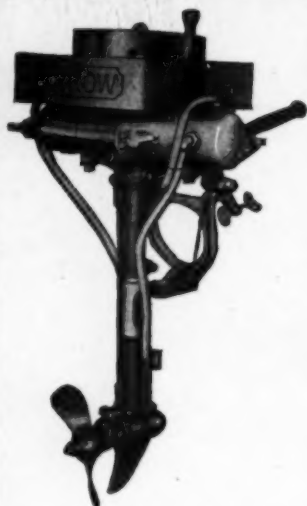
While our limited building space lasts, we will serve you courteously, efficiently, and without excess profit just as we have served all Matthews customers for many years back.

THE MATTHEWS BOAT COMPANY

MARINE RAILWAYS, STORAGE BASIN AND WORKS

PORT CLINTON

OHIO



ARROW two cylinder rowboat motor, 4 H.P.; has greater speed, greater power and greater flexibility than any other detachable engine; readily controlled and economic fuel consumption. Has special new ARROW tilting device, which enables you to overcome obstructions and to beach your boat without removing the engine.



Waterman Model K-1 inboard, one cylinder, $2\frac{1}{2}$ H.P.; weight 36 lbs.; bore $2\frac{3}{4}$ ", stroke 3"; engine equipped with aluminum crank case and base and copper water jacket. For your canoe or small boat.

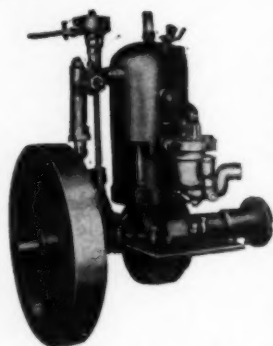
1918 Arrow - Announcement - Waterman

A cordial invitation is extended to all our friends visiting the New York Show to call at our booth, and to those who are unable to attend we will gladly send our 1918 catalogue.

We shall maintain the same high standard of quality and expert workmanship during 1918 which has characterized our products in the past.

ARROW MOTOR & MACHINE COMPANY, Inc.
632 Hudson Terminal Building New York

FACTORY: NEWARK, N. J.
Foreign Office 47 Broadway, New York City J. E. Sitterley Foreign Sales Manager



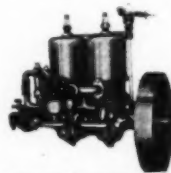
Engines on display at Room 624, 30 Church Street and at Ruppert & Colson's, Concourse, 30 Church Street.

Waterman Model A-4 Special, inboard, 4 H.P.; weight 111 lbs.; bore 4", stroke 4". A medium duty engine for all round purposes; noted for its simplicity in design and construction, dependability and economic operation.



Waterman PORTO, 3 H.P.; the original detachable engine; has more advantageous features of mechanical refinement, which add to its simplicity of operation than any other detachable engine on the market.

Waterman Model K-2 inboard, two cylinder, 5 H.P.; weight 60 lbs.; bore $2\frac{3}{4}$ ", stroke 3"; engine equipped with aluminum crank case and base and copper water jacket. Specially suited for light weight boats.



King of Marine Carburetors

KINGSTON

THE WORLD'S
MOST POPULAR
CARBURETOR



This is the carburetor that will give you the highest speed and power of which your engine and boat are capable. And it will do this on the lowest fuel consumption per hour, per horsepower.

The Kingston Carburetor is scientifically designed for modern engines and modern fuel. It is making good and giving extreme satisfaction on every type of marine engine, automobile, tractor, motor cycle or other kind of gas engine. One simple adjustment covers all ranges.

It is the efficiency and popularity of the Kingston Carburetor that has made us the largest carburetor manufacturers in the world.

Write our nearest branch for details and trial offer.

Byrne-Kingston & Co., Kokomo, Indiana, U. S. A.

New York: 1733 Broadway

Chicago, Ill.: 1430 Michigan Ave.

Detroit, Mich.: 570 Woodward Ave.

Los Angeles, Cal.: 334 W. Pice St.

Boston, Mass.: 111 Haverhill St.

1918 belongs to the Berling

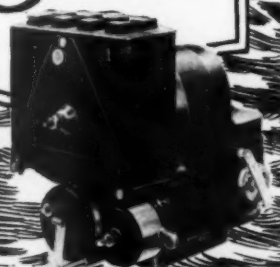
During 1918, the Berling Magneto will again be regular equipment on more leading marine motors than any other magneto. After years of actual test under actual marine conditions, the biggest manufacturers all endorse the Berling as the one magneto worthy of their products.

A hot, fat spark, and dependability when emergency arises—are yours if your marine motor is Berling Equipped.

Let us tell you the complete
Berling story.

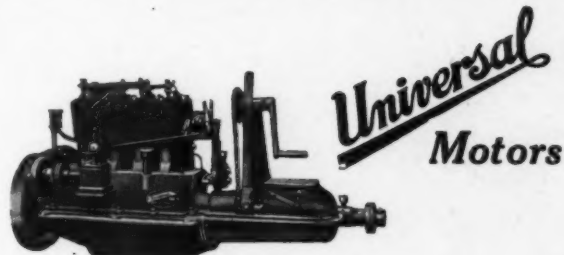
ERICSSON
MANUFACTURING
COMPANY
1105-1145 MILITARY ROAD
BUFFALO, N. Y.

Berling Magneto



Worth more
Does more

In The Fiji Islands and In The Cold Waters of British Columbia



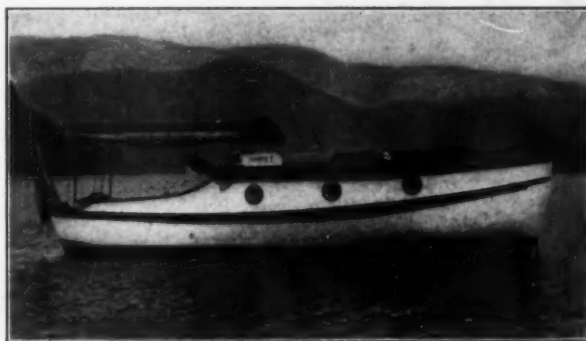
Are Equally Popular and Satisfactory

Mr. R. G. Rankin of Labasa, Fiji,
writes under date of Nov. 10, 1917:

"Your motor has given me great satisfaction. I have run up to seven hours without a stop, engine going smoothly, in my 25 ft. x 6 ft. raised deck launch. She does about 8 miles per hour and is the most economical motor here on fuel, which is a big item, as we pay 25/— or five dollars per case here in Fiji."

Mr. Geo. Mitchell of Vancouver, B. C., whose 25 ft. x 6 ft. 6 in. cruiser "Myrtle" is shown below, writes under date of Dec. 3, 1917:

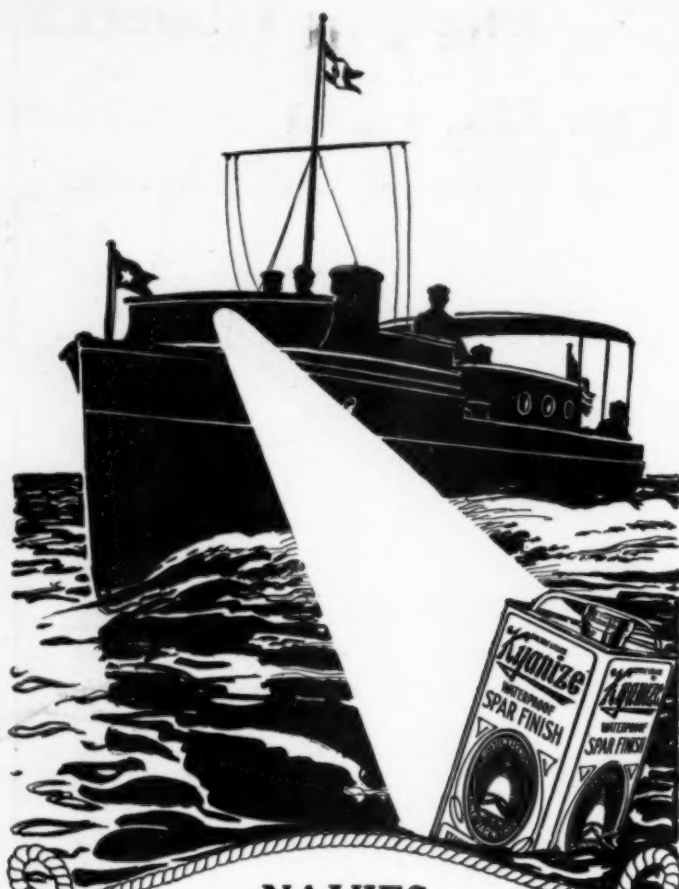
"I requested Mr. Lucas, of Ferrier & Lucas, to get me one of your engines over a year ago, and I wish to state that I have never regretted my choice. I was strongly advised to get something heavier, as my boat is a raised deck cruiser, 25 ft. by 6 ft. 6 in. beam and 26 in. draft, which I built myself from Defoe patterns. The motor drives her seven miles an hour on a long run and I have ran over 2,000 miles this year with no trouble."



This is the kind of service that is making Universal Motors the favorite and most popular motors of their size. This kind of service would satisfy you, too.

UNIVERSAL MOTOR CO.
Oshkosh, Wis.

Bulletin No. 25 will be mailed you free for the asking.



NAVIES

Throughout the World Are Using

Kyanize

KY-AN-IZE

SPAR FINISH

For strenuous service in any waters of the world, Kyanize Spar, the master clear varnish, has proven itself more than equal to the severest conditions.

Hottest tropical sun,—coldest Arctic storms,—submerged indefinitely in salt or fresh water,—Kyanize Spar Finish will not soften, crack or peel. It's tough and *absolutely waterproof*. Never will it turn white or blue.

20,000 GALLONS

has been purchased by
The United States Navy

Endurance under strain is what counts and Uncle Sam has found that Kyanize Spar meets the severest requirements of our Navy.

You men who take pride in your boats and want to finish them with the most enduring varnish it's possible to make owe it to yourselves to try Kyanize Spar. You'll find it profitable to

Economize with *Kyanize*

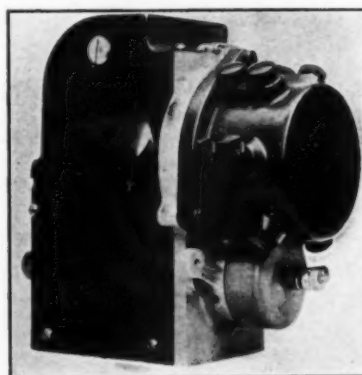
Boston Varnish Company

Everett Station, Boston, U. S. A.

Chicago
Warehouse and Office
519 W. Twelfth St.

San Francisco
Warehouse and Office
311 California St.

better sparks



DIXIE MODEL 124
For twelve cylinders

Dixie and Sumter Magnetos are made for all types and sizes of marine engines—one to twelve cylinders—big and little.

Engines of any size can be started safely, surely, and easily from a Dixie magneto equipped with a Sumter Starter Coupling, without any auxiliary battery.

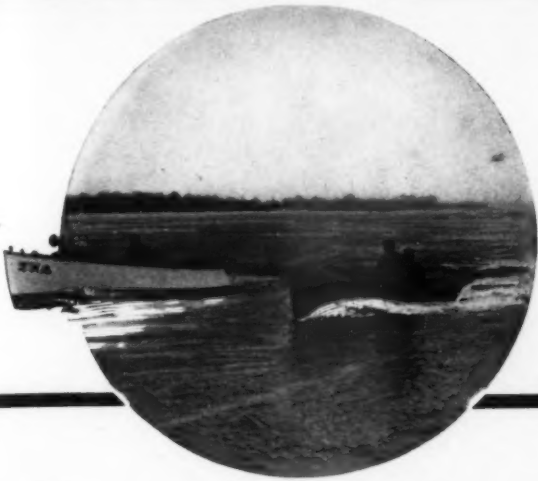
Use Splitdorf Spark Plugs.

See 'em all at the Show

SUMTER ELECTRICAL CO.

1466 Michigan Ave.
CHICAGO

Eastern Office: 3-5-7 West 61st Street, New York



Power Shortage Is Fuel Waste

Don't think you're going to save anything by letting your engine run along short of power. The shortage is very probably due to gas escaping through leaky piston rings,—and you have to pay for it anyhow.

The surest way to get—and keep—maximum power and save fuel is to install a set of

McQUAY-NORRIS LEAK-PROOF PISTON RINGS

The piston ring which is properly designed and constructed to give perfect bearing on the cylinder walls—save friction and undue wear on cylinders.

Your dealer or local garage man can get you any size or over-size rings quickly. Over 300 jobbing and supply houses in all parts of the country carry complete size assortments. There's a McQuay-Norris **Leak-Proof** Piston Ring made for every model and type of motor or engine.

SEND FOR FREE BOOKLET

"To Have and to Hold Power"—a simple clear explanation of piston rings, their construction and operation. Write Dept. B.

Manufactured by

McQuay-Norris Mfg. Co., St. Louis, U.S.A.

Branch Offices:

New York	Chicago	Philadelphia
Pittsburgh	San Francisco	Los Angeles
Seattle	Kansas City	St. Paul
Atlanta		Dallas

Canadian Factory:

W. H. Banfield & Sons, Ltd., 372 Pape Ave., Toronto.



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Advertising Index will be found on page 110

S A N D S SANITARY FIXTURES FOUR SPECIAL CLOSETS



PLATE S-126.

The "Glenora" Composition Sea Cock, for use on supply and discharge of closets.

1/2 in.	\$2.25
1 in.	3.00
1 1/2 in.	5.25
2 in.	8.00

Composition raised strainers, 25c extra.

"COMMERCIAL," PLATE S-2070.

Plate S-2046

"FRISCO" PUMP CLOSET FOR "WORK BOATS." VITRO-ADAMANT OVAL BOWL COMPOSITION 3" PUMP, FINISHED SMOOTH. OAK SEAT AND COVER, \$63.50. OAK SEAT, NO COVER

\$62.50

Plate S-2070

"COMMERCIAL" CLOSET FOR "WORK BOATS." VITRO-ADAMANT OVAL BOWL, COMPOSITION FLUSH VALVE, OAK SEAT AND COVER, \$60.00. OAK SEAT, NO COVER

\$59.00

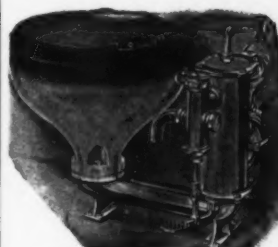


PLATE S-2062.

The "Aegle" Composition Ranged Sea Valve, for use on small pump closets. Price per pair, with strainer for supply

\$6.00

"KNOCKABOUT," PLATE S-34.

Plate S-34

"KNOCKABOUT" IMPROVED PUMP WATER CLOSET. VITRO-ADAMANT ROUND HOPPER BOWL. 2 1/2" ROUGH PUMP, OAK SEAT AND COVER

\$52.50

Plate S-2060

"WINNER" PUMP WATER CLOSET. VITRO-ADAMANT ROUND HOPPER BOWL. 2 1/2" ROUGH PUMP, OAK SEAT AND COVER, \$25.00. OAK SEAT, NO COVER

\$24.00



PLATE S-4280.

New Pattern Improved All Brass Galley Pump, 2" cylinder with shut off cock. Pat. Brass...\$12.50 Pol. & N. P. 14.00

We make special pumps for oil and gasoline fitted with brass valves.



PLATE S-150.

The "Glenwood" Folding Lavatory, with Vitro-Adamant roll rim tipped oval basin. N. P. copper lining, soap and brush holders. N. P. brass double acting pump with combination wing supply faucet, N. P. brass towel rack. N. P. brass supply and waste couplings. N. P. brass trimmings.

Quartered oak, polished finish

\$42.50

Mahogany, polished finish, add

1.50



PLATE S-719.

Brass Galley Pump, mounted on iron frame, polished faucet, handle reversible, outlet adjustable. 1/2" 13.00 3/4" 13.50 1" 14.00 For additional side outlet, add 1.00



PLATE S-1002.

Round Flange Composition Monitor Air Ports, with heavy brass frame and hinge to give sufficient rigidity to prevent springing and breaking the glass.

Size of Opening	Price	Size of Opening	Price
8 in.	\$10.75	11 in.	\$17.00
9 in.	13.00	12 in.	20.00
10 in.	14.50	14 in.	28.00

Larger sizes also made. Prices on request.

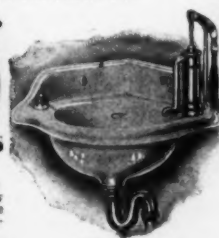


PLATE S-3190.

The "Mono 12" Vitro-Adamant Corner Lavatory with N. P. Brass Pump and waste fittings and N. P. Full "S" Trap... **\$25.50**



PLATE S-128.

The "Helena" Composition Outboard Connection with flap valve and coupling used on discharge of closets, lavatories, sinks or on exhaust of engines.

1/2 in.	\$2.50	1 in.	\$2.75	1 1/2 in.	\$3.00	2 in.	\$7.00
1 in.	2.00	2 in.	2.50	4 in.	4.50	6 in.	6.50

PLATE S-129

Same as above except outlet has large flange for fastening to hull of vessel with bolts. List prices same as Plate S-128.

Owing to the abnormal high prices and scarcity of material and labor, selling prices necessarily are advanced to meet conditions, ranging from list prices as net up to 50% advance over list based upon cost.

A. B. SANDS & SON COMPANY

1849

"Sixty-Nine Years of Quality"

1918

LARGEST MANUFACTURERS IN THE WORLD OF

MARINE PLUMBING SPECIALTIES

22-24 VESEY STREET

NEW YORK, U. S. A.

Advertising With Nothing to Sell

HERE is the broader view of advertising—the kind of faith in the value of general publicity that causes a man to advertise even when he has nothing to sell.

This is worthy of the serious consideration of every executive in the marine field. Those whose entire plants are concentrated on government orders at this time can still retain the good will of their regular customers by keeping their names alive in the public memory.

Duesenberg Motors Corporation

Manufacturers of
Internal Combustion Engines
120 Broadway
New York

M. G. HUNT, General Sales Manager

January 14, 1918.

Mr. E. C. Wright, Business Mgr.,
MOTOR BOATING,
119 West 40th St.,
New York City.

Dear Sir:—

I have been asked repeatedly why we continue to advertise even though our entire capacity is being taxed in the production of motors for the Government. In answer to this query I am inclosing proof of copy for the February issue of MOTOR BOATING, which obviously tells the story. I might add that we cannot accept an order for even one Duesenberg engine in either our marine, automobile, or airplane models, although we are building a duplicate to our already, and but recently built, large model factory at Elisabeth, N. J. It is not likely we shall be in a position to solicit business during the period of the war.

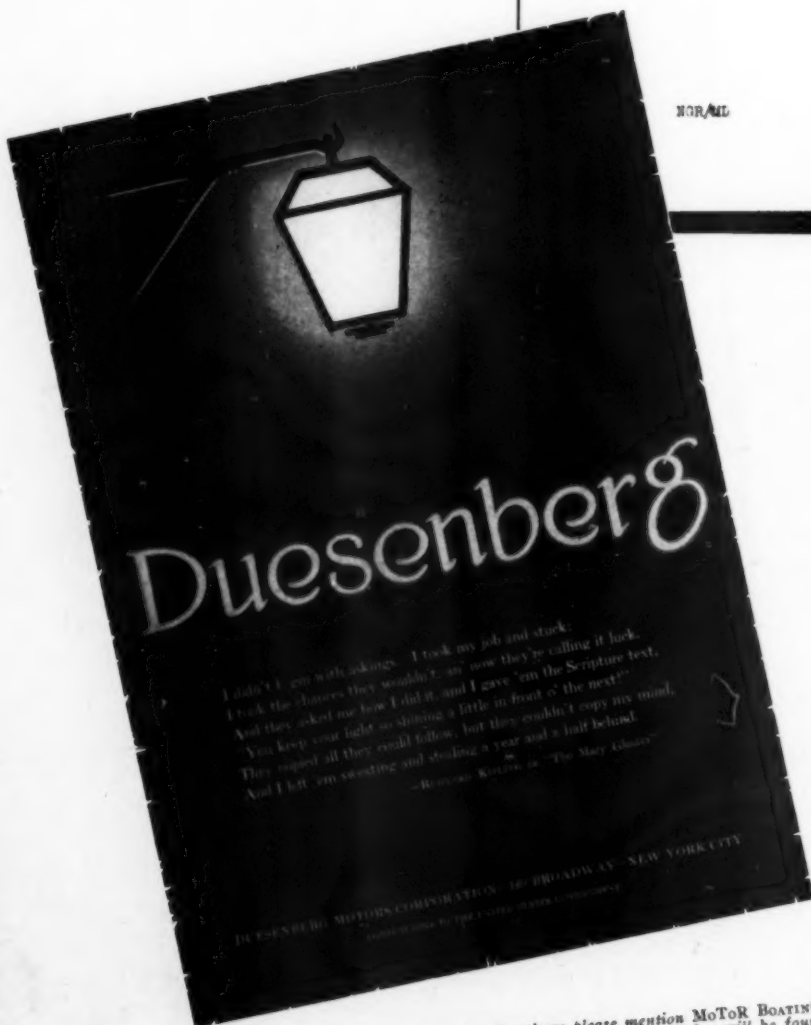
We shall, however, "keep our light so shining" even more persistently than in the past.

Very truly yours,

DUESENBERG MOTORS CORPORATION

M. G. Hunt
General Sales Manager

MOR/AL



Take out an insurance policy on the future of your business. Advertise not only for immediate sales but to make your name an asset of constantly increasing value. If you have a product to sell and can make prompt deliveries, so much the better—but whether you have or not, you can insure your future by advertising now.



The National Magazine
of Motor Boating

119 West 40th Street New York City

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DU PONT AMERICAN INDUSTRIES



Mr. JOHN B. BURNHAM, President American Game Association, says: "Trapshooting is great practice for both experts and beginners and develops crack field shots."

The Clay Pigeon Knows No Game Laws

Mail This Coupon

Marking X before subject that interests you

Trapshooting	Motor Fabrikoid
Trapshooting for Women	Craftsman Fabrikoid
Trapshooting Leagues	Fabrikoid Sheeting
Game Bird Booklet	Fairfield Rubber Cloth
Du Pont Sporting Powder	Industrial Dynamites
Py-ra-lin Toilet Goods	Blasting Powder
Challenge Collars	Farm Explosives
Novelty Sheeting	Anesthesia Ether
Transparent Sheeting	Leather Solutions
Py-ra-lin Rods & Tubes	Soluble Cotton
Py-ra-lin Pipe Bits	Mantel Dips
Sanitary Wall Finish	Bronzing Liquids
Town & Country Paint	Pyroxylin Solvents
Vitrolac Varnish	Refined Fusel Oil
Vitrolac Stain Finish	Commercial Acids
Flowkote Enamel	Alums
Liquid Light for Mills	Wood Pulp
Antoxide Iron Paint	Pigment Bases
Auto Enamel	Tar Distillates
Itaynite Top Material	Dyes and Bases

Name

Address

City State

THERE is no limit of season, law or time. There is no long distance journey to the shooting grounds. There is never the disappointment of not finding game.

TRAPSHOOTING

is always ready at every shooting club. Clay birds are plentiful—ready with their speedy flight and vexing turns to give you more gun thrills to the minute than any "feathered game" can give.

Every man—every woman should know how to shoot and "hit" what they shoot at. The gun club is the place to learn this democratic, patriotic sport. Find out how—now.

Check trapshooting in the coupon—mail it to us and get all the facts.

E. I. DU PONT DE NEMOURS & CO.

Established 1802

WILMINGTON

DELAWARE

The Du Pont American Industries are:


E. I. Du Pont De Nemours & Company, Wilmington, Del., Explosives
Du Pont Chemical Works, Equitable Bldg., N. Y., Pyroxylin and Coal Tar Chemicals
Du Pont Fabrikoid Company, Wilmington, Del., Leather Substitutes
The Arlington Works, 725 Broadway, N. Y., Ivory Pyralin and Cleanable Collars
Harrison Works, Philadelphia, Pa., Paints, Pigments, Acids and Chemicals
Du Pont Dye Works, Wilmington, Del., Dyes and Dye Bases

DU PONT

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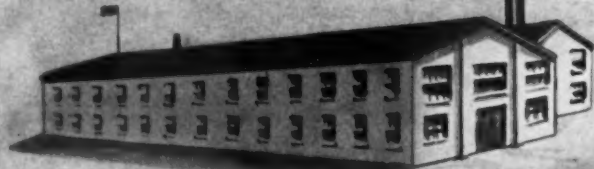


Elizabeth Plant
"a plane an hour"
is our motto

A Real Building

IN one year the Standard Aircraft Corporation has had a growth that marks the building of a Real Fighting Industry.

In June, 1916, the Corporation was reared from a firm about to be closed out, with 40 employees in a factory covering 23,000 square feet. By December, 1916, it was necessary to add 18,000 square feet, and increase the force to 400. Between December, 1916 and June, 1917, 32,000



Plainfield Plant
June 1916
1 machine every
now and then



Real Fighting Industry

Airplanes for US—the United States and our Allies

square feet of factory space were added, and the personnel increased to 1,200.

In August, 1917, the Brill Car Works at Elizabeth were acquired,—giving a factory and flying field covering 90 acres with 170,000 square feet floor space. Between August and December, 1917, 137,000 square feet of buildings were added to the Elizabeth Plant. In less than four months this had been accomplished: Barracks, Dining Hall, Office Building, Kitchen, and connecting two-story building (550 x 50), being built and put into service.

Ten plants within a radius of one hundred miles are devoting their entire capacity to Standard production efforts.

"A PLANE AN HOUR" is our motto—in building this,—a Real Fighting Industry,—with an army of 8000 men and women taking trenches by production.



Airplanes

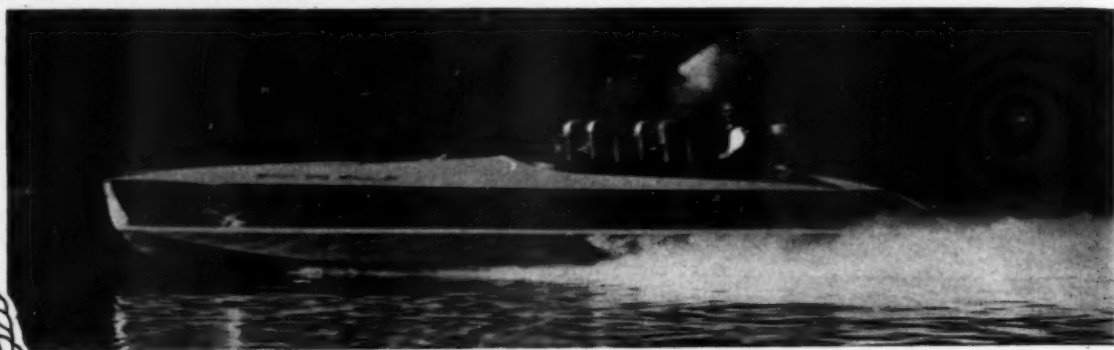
Seaplanes

Factories:

Elizabeth, New Jersey
Plainfield, New Jersey

Executive Office: Elizabeth, N. J.
New York Office: Woolworth Bldg., N. Y.

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Whip-po'Will, Jr. in action. Owned and driven by A. L. Judson, in an official test made at Lake George, in November, 1917. This hydroplane reached the speed of 70 miles per hour.

A. L. JUDSON
SAGAMORE-ON-LAKE GEORGE
NEW YORK

December 11, 1917.

Brooklyn Varnish Mfg. Co.,
35 Bostrand Avenue,
Brooklyn, N. Y.

Gentlemen:

Kneeshaw has sent me your letter of December 6 for answer and he informs me that he used your varnish on the "Whip-po 'Will, Jr."

The boat when it was finished in Detroit and sent to Minneapolis was, I believe, finished with some other sort of varnish, but was refinished with K-A-U-R-I upon reaching Lake George.

Jim also states that he used your Varnish on the big boat "WHIP-PO'WILL" and upon the "HAWK EYE II", and that it gave entire satisfaction.

Yours very truly,

Alfred L. Judson

OF course the fastest boat in the world is finished with K-A-U-R-I,—the varnish that is always used wherever a wear-proof and water-proof finish is demanded! Read this letter from Commodore A. L. Judson of the A. P. B. A. Note what he says about finishing with K-A-U-R-I, not only this speed conqueror, but the speedy boats "Whip-Po'-Will" and "Hawk Eye II," as well. In every case

K-A-U-R-I
TRADE MARK

**Water Proof
Spar Varnish**

is unexcelled for marine work. It is guaranteed not to scratch white or bloom nor will it turn white in salt or fresh water. Climatic changes fail to affect the surface finished with K-A-U-R-I and further, it is unequalled on all exterior wood work, doors, floors, furniture, automobiles, aeroplanes, etc.



Used extensively by the U. S. Navy
Department at their various yards
and on board the Battleships.

While K-A-U-R-I Waterproof Spar Varnish is slightly lower in price than the average varnish, yet the quality is higher. Insist on K-A-U-R-I when doing over your boat this spring.

Manufactured by

Brooklyn Varnish Mfg. Co.,

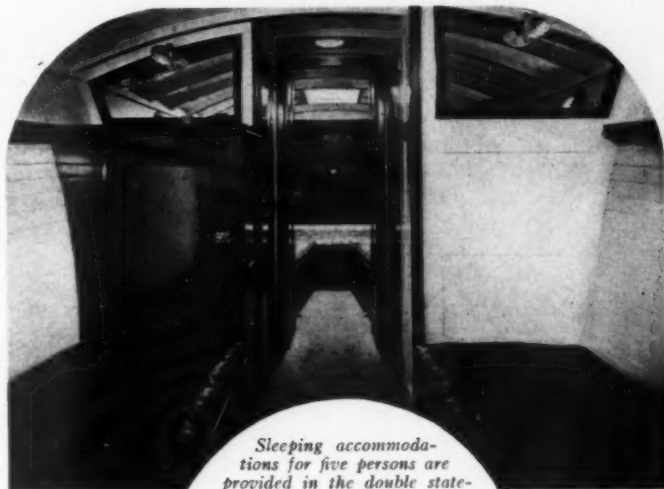
Brooklyn, N. Y.

A STANDARDIZED EXPRESS CRUISER

A Forty-Foot Design Produced to Meet the Requirements of Both Northern and Southern Use. Comfortable Cruising Accommodations for Those Who Wish to Make Week-End Trips

"NOTLIH" was designed and built by the Albany Boat Corporation for Mrs. George P. Hilton, Saugerties, N. Y., and is one of the standardized Albany Forty Foot Express Cruisers. This attractive 40' x 8' 6" Cruiser provides comfortable accommodations for week-end trips as well as for extended cruises.

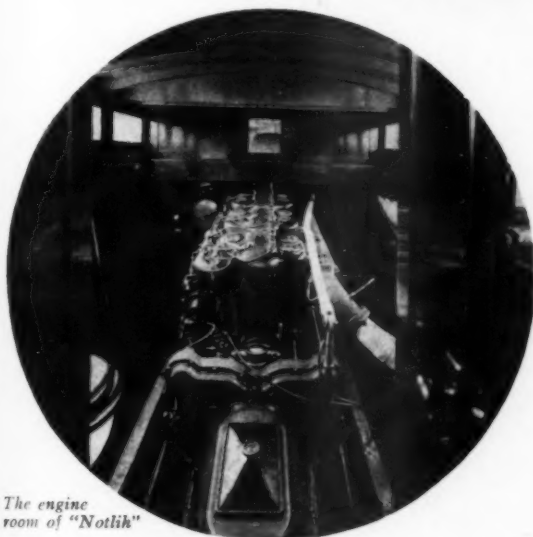
This particular boat is powered with a six cylinder Sterling and a speed of 23 miles an hour is obtained. This same boat, when equipt with an eight cylinder Duesenberg can make 36 miles an hour. It can be supplied to make any maximum speed desired between 18 and 36 M.P.H.



Sleeping accommodations for five persons are provided in the double state-rooms

The outstanding feature of this Forty Footer is the large, roomy and well ventilated engine room completely equipt with every modern piece of equipment for ease, safety and efficiency in the handling of the power plant. All Albany Boats are noted for the efficient manner in which the engine compartment is designed, constructed and equipt.

Cabin arrangements permit of two large staterooms, a roomy galley and toilet. For a boat of this length the interior arrangements are unique and very commodious. The appointments are all that could be desired.



The engine room of "Notlih"

A booklet has been prepared describing and illustrating this Standardized Albany Forty Foot Express Cruiser. Write to-day for booklet No. 35, you will find it of interest and well worthy of a few minutes of your time.

A definite number of these Forty Foot Express Cruisers have been scheduled through our factory; when this number is definitely contracted for, it will be difficult to obtain prompt delivery. An early order presages a satisfactory shipment date.



A stern view of "Notlih"



ALBANY BOAT CORPORATION, WATERVLIET, N. Y.

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Safety—No Matter

Moving picture of a man putting on an Ever-Warm Safety-Suit. See this picture at the Motor Boat Show.



DON'T risk the perils of sea travel under present conditions until you have taken every precaution to reduce the risk to the lowest possible terms. In other words, provide yourself with a life preserver which positively assures the safety of your life, no matter what may happen. The only such life preserver is the

Ever-Warm Afloat—Alive—Safe—Dry

When you consider the meaning of the words "life preserver" you will concede that the Ever-Warm Safety-Suit is the *only real life preserver* ever devised,—and the greatest life-saving invention of the age. Where the ordinary so-called "life preserver" merely floats the wearer, the Ever-Warm Safety-Suit keeps him afloat, alive, safe, dry, warm and comparatively comfortable, for hours or days, whether strong or weak, whether conscious or unconscious.

A few minutes' exposure in the open ocean in this weather would mean almost certain death to the most robust constitution you have ever known. In sea disasters more persons have died from exposure than by drowning. The warmth produced by the Ever-Warm Safety-Suit is therefore as important as the buoyancy.

Every soldier and sailor, officer or private, doctor and nurse, who must cross the ocean this year is entitled to the protection of an Ever-Warm Safety-Suit. It is *your* privilege to provide it.

International Life



U. S. A. Co.
Soldiers by
Ever-Warm
Suits before
for "Sanctuary"
France.

What May Happen

It is not a proof of personal bravery to risk your life needlessly, where nothing is to be gained if you lose. Rather it is a matter of patriotism to conserve your life and thus add your share to the man-power which is vital to the winning of the war for democracy.

Safety-Suit Warm and Comfortable

The effectiveness—the infallibility—of this suit has been proved in hundreds of trials and emergencies in the past two years. It is now carried by passengers on practically every liner and transport on the Atlantic today. It is all that is claimed. Where you have one of these suits, you have the last word in SAFETY AT SEA.

The Ever-Warm Safety-Suit gets its buoyancy not from air, but from a special composition which has five times the buoyancy of cork. It enables the wearer to support at least five other persons afloat indefinitely. Its buoyancy is indestructible—even if the suit be punctured, torn or cut, you cannot drown. The suit can be put on in less than a minute.

Suit Corporation

Sole Agents and Distributors

11 Broadway

New York City

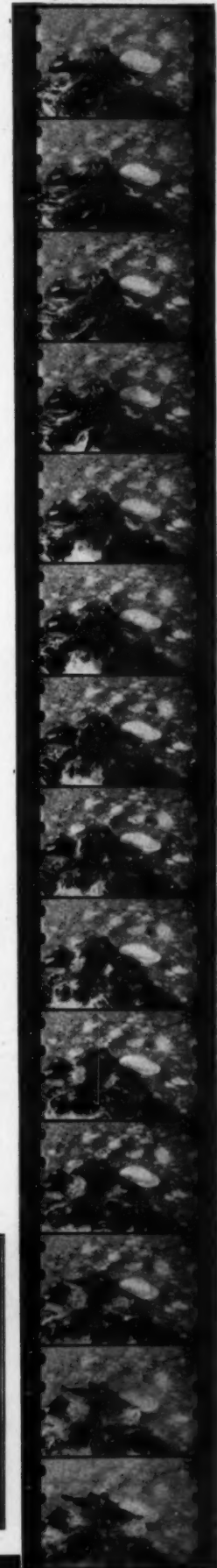
Tenth Floor

Phones: Bowling Green 8609 and 8775

See the demonstration of the Ever-Warm Safety-Suit at the Motor Boat Show and in the "Movies." Investigate as thoroughly as you wish. We are always glad to demonstrate the suit in water. Where human life is at stake, no amount of time or money is too great a price to pay for safety; and the price of this great life saving suit is within the reach of all.

N.B. We advise you to order your Ever-Warm Safety-Suit as early as possible as the tremendous demand at this time is taxing our facilities to the utmost. Made in all sizes for men, women and children. Don't fail to see the suits and to talk with us at the Motor Boat Show. Call at our office or write for full details and prices today.

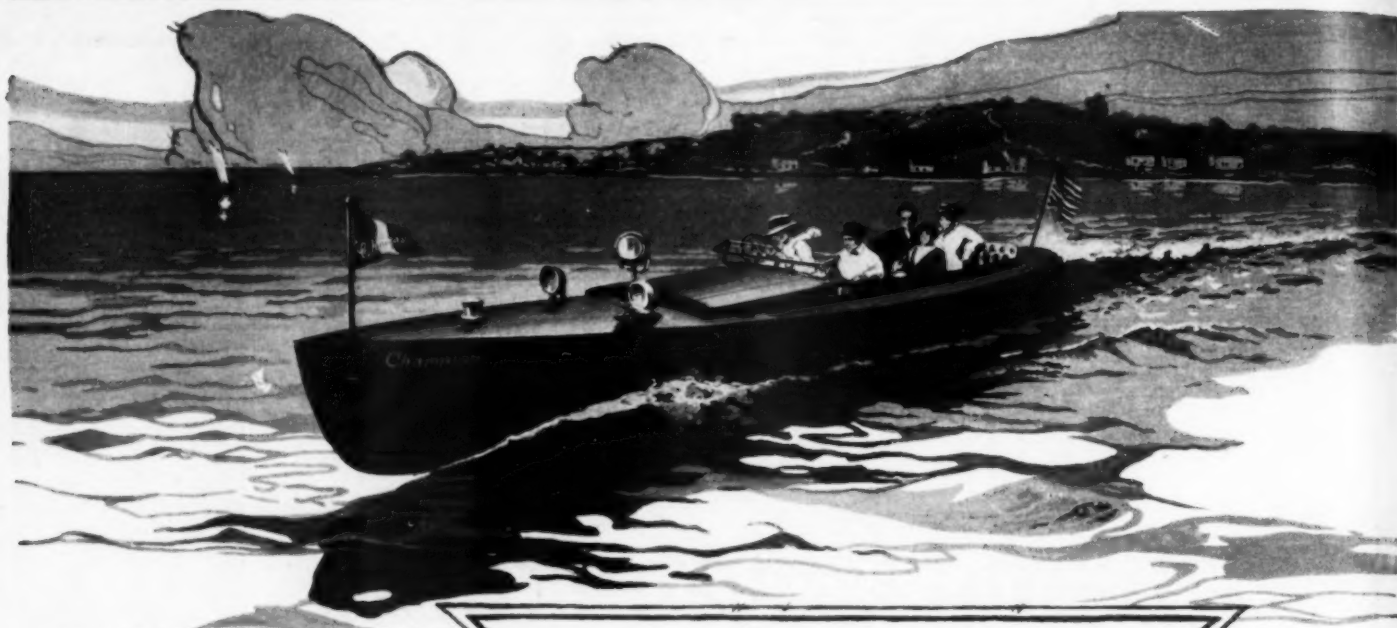
Adrift in a field of ice wearing Ever-Warm Safety-Suits. The white spots are cakes of ice.



New York Harbor, December, 1917. The Ever-Warm Safety-Suit wearers in the water are more comfortable than the spectators in their furs and overcoats.

After their plunge, the wearer's clothes are as dry and warm as before the immersion.





Absolutely Unaffected by Moisture, Will Act- ually Spark in Water

The Champion Reliance is the spark plug par excellence for marine motors.

It is absolutely unaffected by moisture—in fact it will actually spark in water.

That's the sort of dependability that counts in motor boating.

Wherever water is available for motor boating there the Champion Reliance Spark Plug is a standard piece of merchandise.

Champion Reliance — spark-in-water—don't forget the name—and look for it on the porcelain of the spark plugs you buy for your marine engine—it is your guarantee of dependability.

Champion Spark Plug Company
TOLEDO, OHIO



Champion Toledo

DEPENDABLE SPARK PLUGS



\$1.25

SEA SLED

Reg. U. S. Pat. Off.

HICKMAN PATENTS THROUGHOUT THE WORLD

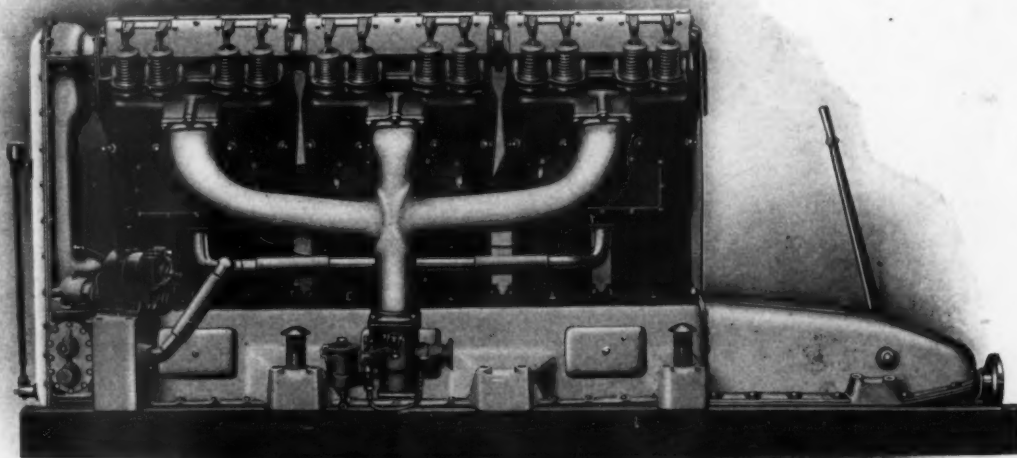
31 Knots for Continuous Service



As Another Step Toward Reliability in High-Speed Boats Driven by Gasoline Engines

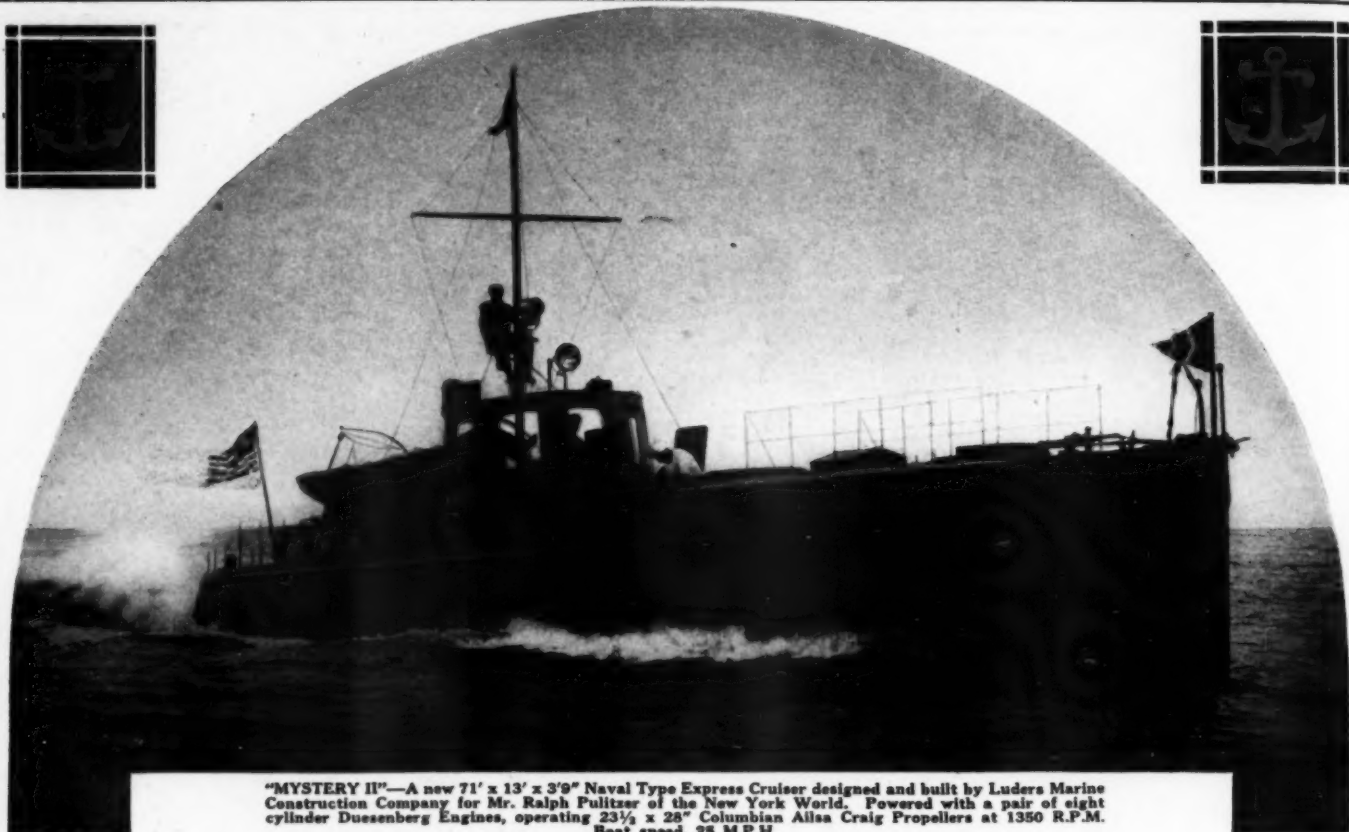
in the 38' x 9' Sea Sled fitted with two six cylinder, $7\frac{1}{4}$ " x 9" high-speed Murray & Tregurtha engines, we are guaranteeing 31 knots (35.69 statute miles per hour) on 12-hour runs at engine speeds below 1000 r.p.m.—and repeat it after you have finished if you wish.

This is accomplished by combining the unparalleled efficiency of the Sea Sled with the high power at low revolutions of this engine.



Murray & Tregurtha Co.,
340 West First Street,
South Boston, Mass.

Viper Co., Ltd.,
Pictou, Nova Scotia,
Canada.



"MYSTERY II"—A new 71' x 13' x 3'9" Naval Type Express Cruiser designed and built by Luders Marine Construction Company for Mr. Ralph Pulitzer of the New York World. Powered with a pair of eight cylinder Duesenberg Engines, operating 23½ x 28" Columbian Ailsa Craig Propellers at 1350 R.P.M. Boat speed, 25 M.P.H.

Copyright
Brown & Dawson

COLUMBIAN

Columbian Propellers fit every requirement of the power boat owner. On these two pages you will find illustrations of four distinctly different types of boat, yet the properly designed Columbian Propeller is used in each instance, despite the wide diversity of the speed and working requirements. No matter what your boat may be, there is a Columbian Propeller designed for it, a Columbian Propeller which will give you more speed and better efficiency.

COLUMBIAN BRONZE CORPORATION

GENERAL OFFICES:—50 CHURCH STREET, NEW YORK CITY.

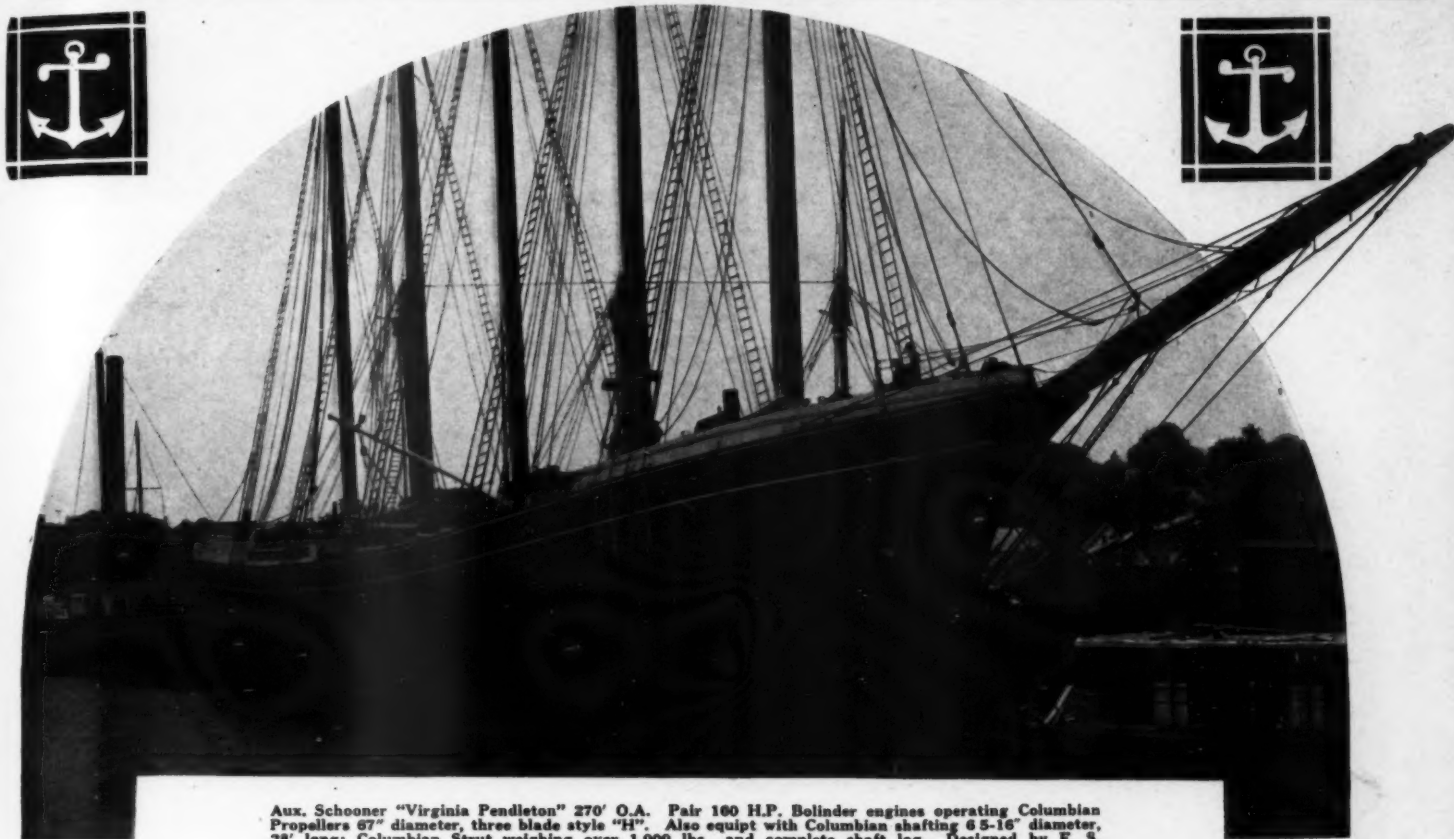
New York City Local Salesroom—Concourse, 50 Church Street

Factory—Freeport, Long Island, N. Y.

Address all mail to the General Offices except for New York City Sales

"STERLING II" 26' x 5' V-Bottom Runabout, designed by Crouch and built by Layard Boat Works. Speed 34 M.P.H., with a four cylinder Sterling engine turning an 18 x 28" Columbian Rocket Propeller, 1450 R.P.M. Owned by Wm. Bruns, New York City.





Aux. Schooner "Virginia Pendleton" 270' O.A. Pair 160 H.P. Bolinder engines operating Columbian Propellers 67" diameter, three blade style "H". Also equipt with Columbian shafting 6 5-16" diameter, 28' long; Columbian Strut weighing over 1,000 lbs., and complete shaft log. Designed by F. S. Pendleton. Built of galvanized iron, steel keelsons, beams, etc.

PROPELLERS

The Fastest Boat in the World uses a Columbian Propeller. "Whip-po-Will, Jr.," illustrated hereunder, averaged 69.39 M.P.H. in six one-mile runs on Lake George under official A. P. B. A. supervision and timing. One run was made at 70.15 M.P.H. Further evidence of the ability of our Designers to design propellers of the highest efficiency.

COLUMBIAN BRONZE CORPORATION

GENERAL OFFICES:—30 CHURCH STREET, NEW YORK CITY.

New York City Local Salesroom—Concourse, 30 Church Street

Factory—Freeport, Long Island, N. Y.

Address all mail to the General Offices except for New York City Sales

Seventy miles an hour in a hydroplane. "Whip-po-Will, Jr." Commodore Judson's wonderful hydroplane, powered with a twelve cylinder Van Bierck engine, operating a 22 x 38" Columbian Alisa Craig Propeller, created a new official record of 69.39 M.P.H. at standardized mile trials on Lake George. Best one-mile dash at 70.15 M.P.H.





There she goes!

A remarkable photograph of a torpedo, taken within the tiniest fraction of a second after it had left the tube of one of Uncle Sam's destroyers.

History is fast being made by these modern Greyhounds of the Sea—whose low, sleek hulls hold their smoke-screened course at express-train speed.

More and more important is the part played by the internal combustion engine. The marine motor has come into its own.

Particulars regarding the type of transmission used on America's finest marine motors—including those used in the auxiliary service of the U. S. Navy—will be gladly sent on request.

PARAGON GEAR WORKS

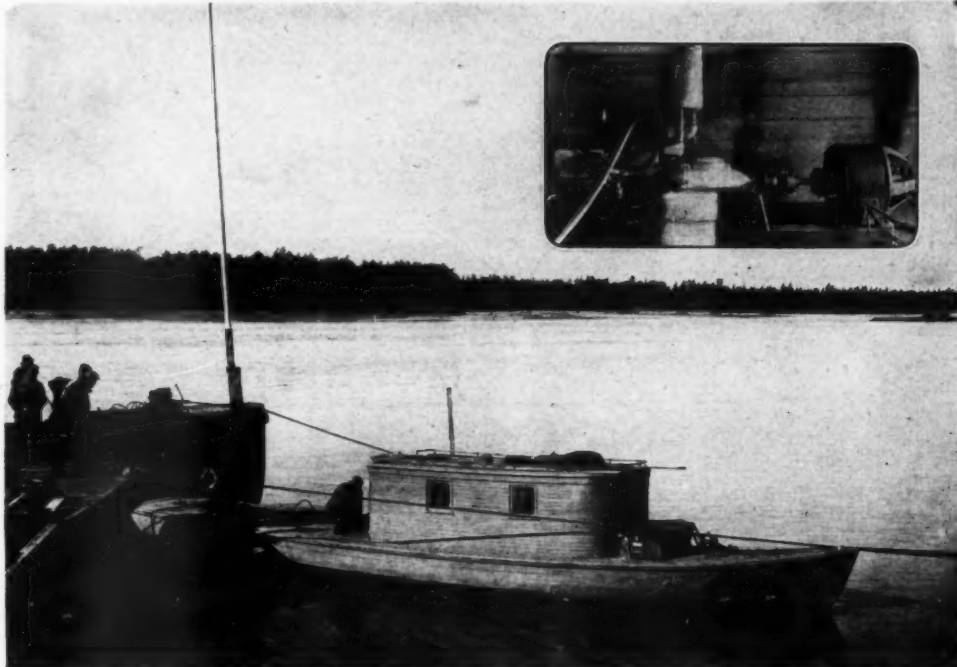
CUSHMAN ST. TAUNTON, MASS.

Photo copyright by E. Muller, Jr., New York, N. Y.

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Advertising Index will be found on page 110

Scripps

KEROSENE—DISTILLATE GASOLINE



U. S. GAS BOAT "STANDARD," DEPT. OF INTERIOR. ALASKAN ENGINEERING COMMISSION, ANCHORAGE, ALASKA.

A MESSAGE FROM ALASKA

In this present day of conservation and prudence in buying, true economy prescribes more than at any time heretofore the purchase of a motor on performance rather than price. Maintenance, operating expense and dependability are real vital factors.

For over ten years SCRIPPS engines have been so well and carefully built that the item of maintenance has been an almost negligible factor with SCRIPPS owners. SCRIPPS dependability has proven itself time and time again. Now with only low grade fuel available and gasoline at a high price the ability of the SCRIPPS to properly handle kerosene, distillate and other low grade fuels makes it a real economy engine.

SCRIPPS engines have made an enviable record in all classes of marine service—pleasure, cruising, racing and commercial.

Through the courtesy of Mr. H. G. Locke, port engineer Alaskan Engineering Commission, Anchorage, Alaska, we reproduce the photo of the United States gas boat "Standard," operated by the Department of the Interior.

What the Series "B" Model HB SCRIPPS is capable of doing in service is best explained by Mr. Locke himself. We are pleased to quote verbatim from his report:

I wish to report the remarkable performance of your Model HB four cylinder type motor at this place.

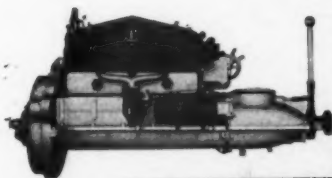
It was placed in the 41-ft. tunnel launch "Standard," was used on the Susitna and Talkeetna Rivers as a tender, running steadily between Susitna Station and Talkeetna, a distance of one hundred miles in one of the swiftest streams in the United States.

After the close of navigation I removed the engine and connected it to a 10 K.W., 80 ampere generator, turning it 850 R.P.M. As our days are very short at this time of the year, it runs 19 hours out of every 24, burning straight distillate and holds the voltage as steady as though it had a delicate governor attached (which it hasn't).

I can't say too much for the SCRIPPS motors as they have given me less trouble than any motors we have on the works. Last month we had an agricultural fair here, and as the city plant was overtaxed they were unable to furnish light for the fair-grounds. They called on me and I sent this little power plant over and had the ground lit up three hours later.

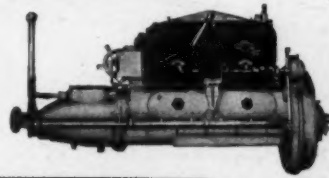
Now if you care to use my name you can do so as I am strong for the SCRIPPS product. Have two Model K SCRIPPS that I have been using for the past two seasons with no trouble whatever. I am operating twelve gasoline boats, four of them twin screw 170 H.P. each. I have been in the gasoline engine game for over twenty years and have handled gas engines of all standard makes. I want to say the SCRIPPS motors don't have to take second place for any gasoline engine built.

(Signed) H. G. LOCKE,
Port Engineer, Alaskan Engineering Commission.



The SCRIPPS line is unusually complete. It includes power plants for every marine purpose, of every size and type from 10 to 125 H.P.—all four cycle engines in two, four and six cylinders, medium duty or high speed—some using gasoline exclusively, others fitted for burning either gasoline or kerosene.

Catalog on request.



SCRIPPS MOTOR CO., 631 Lincoln Ave., Detroit, Mich.

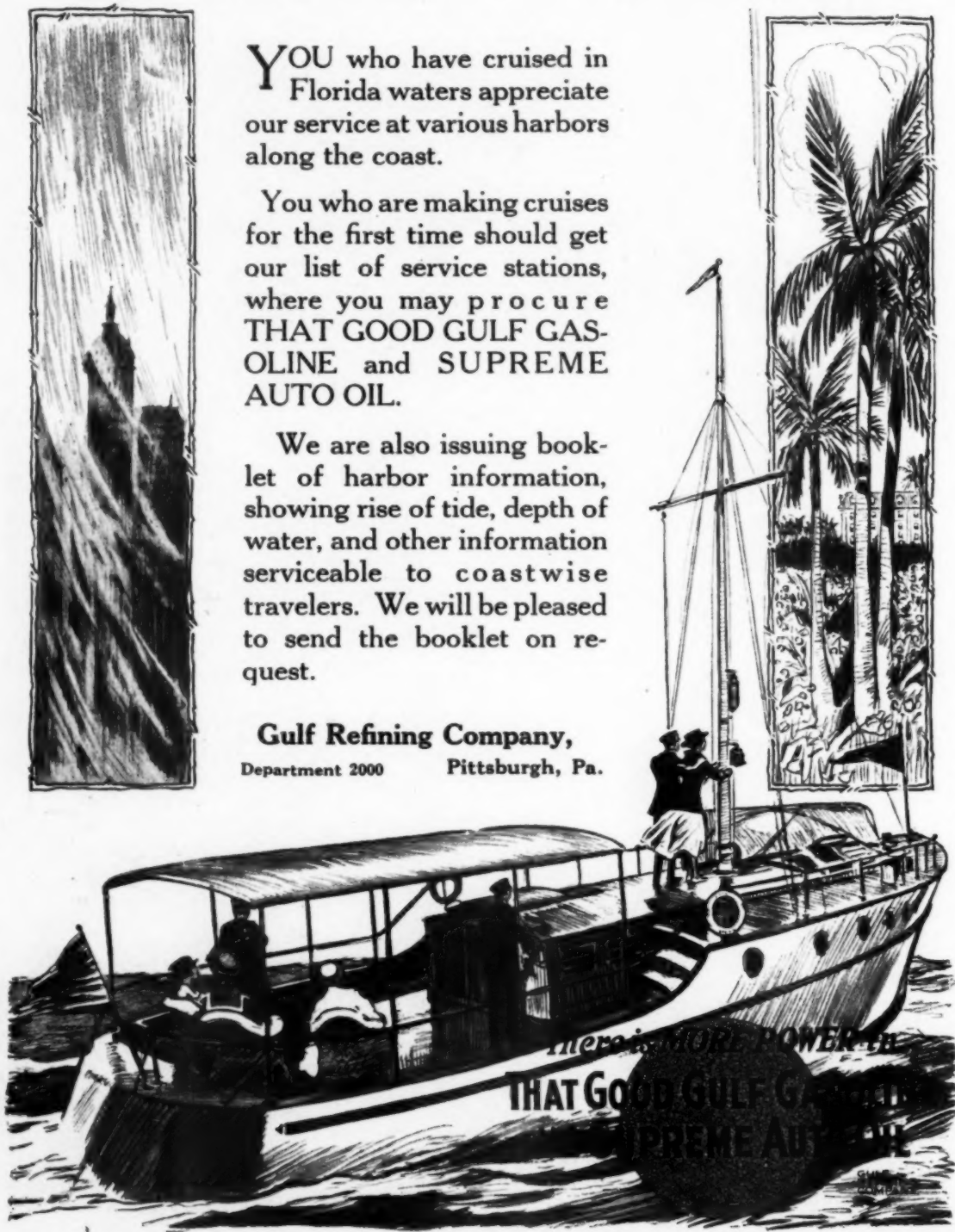
Making it Easy for the Cruising Motor

YOU who have cruised in Florida waters appreciate our service at various harbors along the coast.

You who are making cruises for the first time should get our list of service stations, where you may procure **THAT GOOD GULF GASOLINE** and **SUPREME AUTO OIL**.

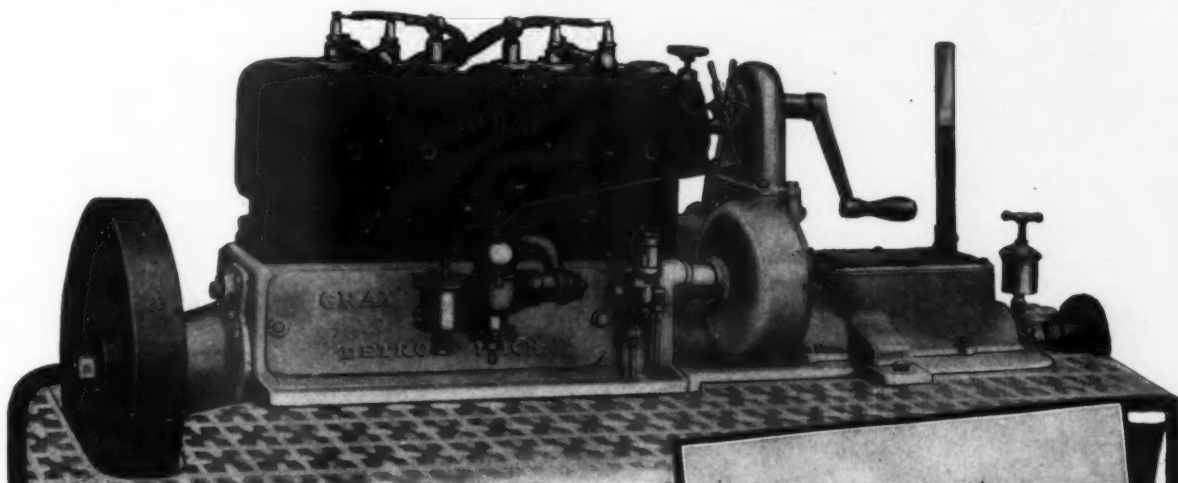
We are also issuing booklet of harbor information, showing rise of tide, depth of water, and other information serviceable to coastwise travelers. We will be pleased to send the booklet on request.

Gulf Refining Company,
Department 2000 Pittsburgh, Pa.



GRAY MOTORS

Largest Builders of Small Marine Motors in the World



Gray Model "D" 4-Cycle THE ADAPTABLE ENGINE

Made good in every case. Semi Speed-boat, Work-boat, Cruiser and House-Boat.

Designed strictly for *marine* work—a real *marine* motor with all the marine features you have always wanted at a *moderate* price. Manufactured and backed up by an old established and responsible concern.

10-12 H. P. Model "D" 4-Cycle

Designed especially for fishing boats or any other boats where reliability, strength and endurance are the chief factors. Can be throttled down to slow speed.

GRAY TWO-CYCLES—Recognized all over the world as the standard two-cycle marine motor. Made in sizes 3 to 11 H.P.

Write today for marine catalog, showing complete line of GRAY two- and four-cycle marine motors. It's instructive.

**THERE'S A "GRAY" FOR EVERY BOAT
STANDARD THE WORLD OVER
3 to 40 Horse Power \$74.00 Upwards**

We have been in the Marine Engine business for twenty-one years. We constantly strive for universal efficiency and better motors and as a result Gray Marine Motors are Standard the World over.

SAVE MONEY—ORDER NOW AND AVOID DELAY NEXT SPRING

GRAY MOTOR CO.

2106 Mack Avenue

DETROIT, MICH.

GRAY 2 STROKE & 4 STROKE
MARINE MOTORS



COMPACT AND
LIGHT ENOUGH
FOR A 16 FOOTER



ENDURANCE
36 HRS. CONTINUOUS
REGULAR RUN



POWERFUL ENOUGH
FOR A GOOD
SIZED CRUISER



SILENT, SMOOTH
POWER FOR
HOUSE-BOAT USE

Use Business Methods In Buying Your Boat Engine



Get this book and learn all about Power Boat Engines

Bristling with valuable suggestions and interesting information this book contains the very essence of what you must know to buy your boat engine intelligently.

The book describes and pictures the complete line of *L-A* engines for launches, cruisers, work-boats, etc. It gives you comprehensive knowledge of the size and power engine for your boat. And it offers timely advice to aid you in your selection.

If you plan purchasing an engine, or can use this book merely for comparative purposes, send for it at once. Clip and mail the coupon below—now!

MARINE ENGINES

Inboard and Outboard *2 & 4 Cycle—2 to 20 H.P.*

There's an *L-A* Engine for every size boat.

Ranging from the portable 1 cylinder, 2 h.p. outboard engine to the big 4 cylinder, 20 h.p. inboard motor, the *L-A* line is complete and embodies throughout the same fine workmanship and skillful engineering.

Built to an ideal of simplicity, strength and durability *L-A* Engines have stood the test of years.

They are beautifully clean and compact in their lines, easy to understand and readily accessible in all parts. They accurately meet the requirements of the man who demands a thoroughly dependable power plant for pleasure or work boat. Five well-known engineers selected *L-A* engines because they proved *L-A* superior ability.

The 30 Days' Trial Plan gives you a generous opportunity to determine *L-A* performance before you decide.

LOCKWOOD-ASH MOTOR CO.

1801 Horton Avenue—Jackson, Michigan

Lockwood-Ash Motor Co.

1801 Horton Avenue
Jackson, Michigan

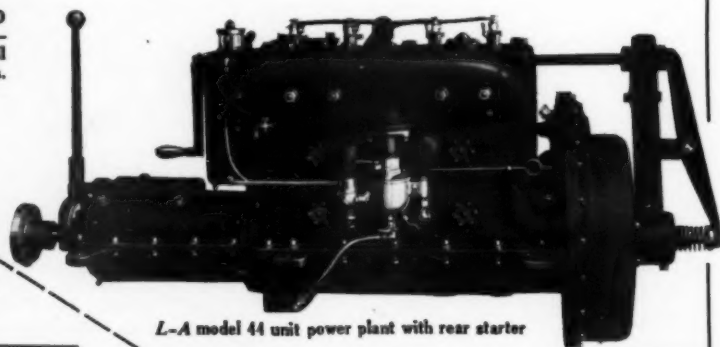
Please mail me a copy of your book that will give me information on the construction and operation of marine motors.

(Name) _____

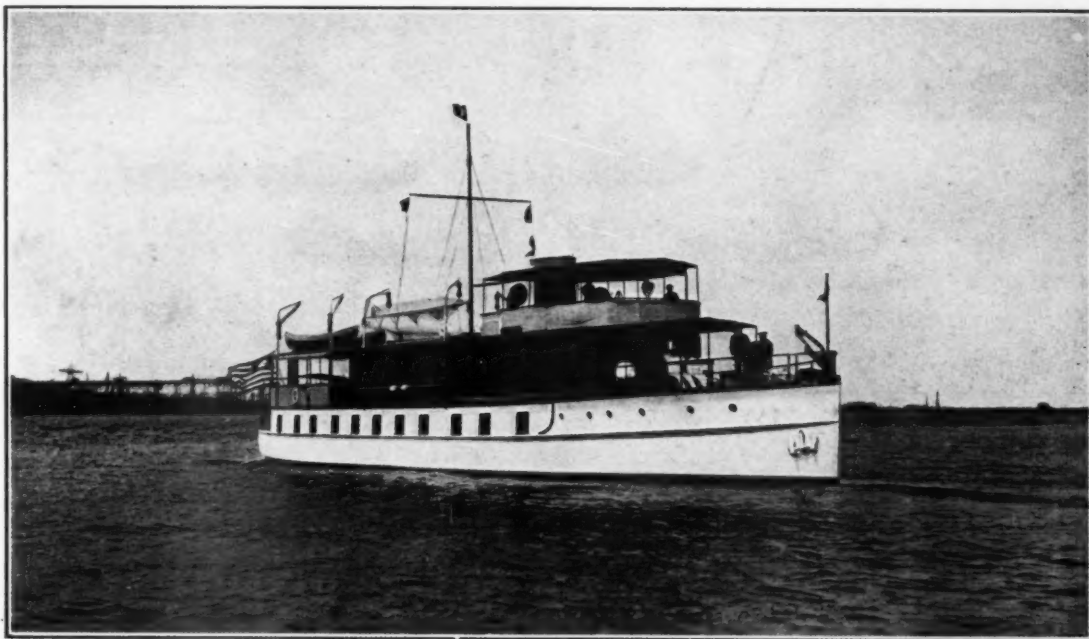
(Street No.) _____

(City and State) _____

Liberty Bonds—\$102 for every \$100 bond; \$51 for every \$50 bond—will be accepted in part or full payment for *L-A* motors.



L-A model 44 unit power plant with rear starter



106-ft. Houseboat Leonie, designed and built by us for Mr. Murray Guggenheim, New York

THIS winter, while we are bending our utmost efforts to assist your Uncle Sam in "making the world safe for democracy," it will be no small satisfaction to us to realize that in Florida

Mathis-Built Houseboats

will be making enjoyable the leisure moments of many of America's busiest men.

Added to the large and growing family of Mathis-built houseboats which have been the feature of every Florida season since 1909—when we created the new-type Cocopomelo—will be the boats of men who know where and how to get the utmost in service and comfort. Men like

MURRAY GUGGENHEIM, NEW YORK, whose 106-ft. Mathis-built houseboat Leonie is shown above.

L. H. & A. W. ARMOUR, CHICAGO, whose 106-ft. Chieftain is in many respects similar to the Leonie.

JAS. DEERING, CHICAGO, whose 80-ft. houseboat Nepenthe, we designed and built.

A. P. ORDWAY, NEW YORK, whose 71-ft. houseboat Jane VI, we completed last winter.

H. N. BARUCH, NEW YORK, for whom we have built several houseboats.

The same service which we have given these men is yours, when you are ready to plan or build your houseboat, or cruiser.

MATHIS YACHT BUILDING CO.

COOPER'S POINT

CAMDEN, N. J.



100 H. P. TOW BOAT GEORGE C. VANTUYL

SAVES
\$540⁰⁰
A MONTH

ECONOMICAL POWER

Lower First Cost and Fuel Cost

than is the case with Diesel and other oil engines. ONE-TENTH the fuel cost of gasoline. ONE-FOURTH the fuel consumption of a steam engine. Use coal, charcoal or coke fuel and a gas or gasoline engine.

**Nelson
Blower & Furnace Co.**
17 ELKINS ST.
BOSTON, MASS., U. S. A.

Chicago, Ill., Sept. 29, '17.
Mr. H. Jacobsen,
25 No. Dearborn St., Chicago, Ill.

I have a 50-H. P. Galusha Gas Producer in connection with a 60-H. P. Engine installed in my Passenger Boat the "CHICAGO" plying between Lincoln Park, the Municipal Pier and Grant Park.

Here is a brief report or data of the operation during this summer:—

I have run my boat every day, (a few rainy days excepted) from about 9 A. M. to 11 P. M. without losing one minute, and I run the engine "dead slow" at the docks without any danger of stalling. This shows absolute reliability.

The consumption of Pea Coal, has amounted to not over 1½ tons of coal a week or a cost per day of less than \$2.00 while gasoline would have cost me \$20.00 per day, a saving in cost of fuel of some \$540.00 per month. This is real Economy.

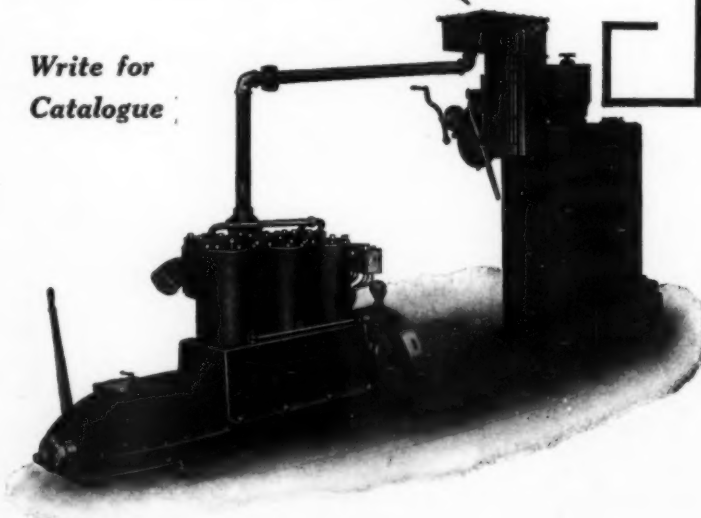
I have run my boat all day in storms and heavy seas, when all the "double deckers" had to tie up at their docks, and this weather did not interfere with the operation of the gas producer at all.

To prove my satisfaction, I will add, that I shall most certainly install this kind and make of power in my next boat.

Very truly, FRED WEIMER.

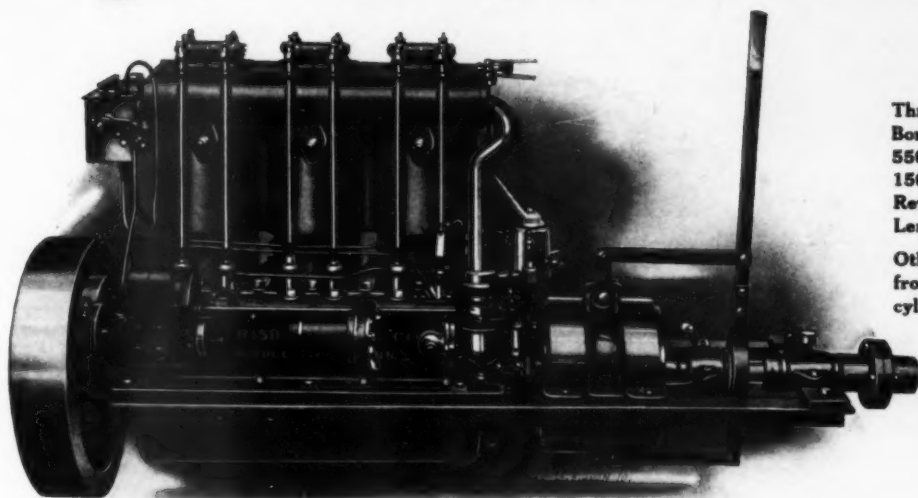
In hard service two years. Uses but 1000 lbs. of coal in ten hour run. Coal gas used instead of gasoline in a gasoline engine. Sister steam tug uses four times as much coal to do the same work.

Write for
Catalogue





Dependability



Three Cylinder, 18-25 H. P.
Bore 6", Stroke 6", Speed 400-
550 R. P. M. Minimum Speed
150 R. P. M. Weight with
Reverse Gear, 1050 lbs.
Length, 65 3/4 in.

Other Frisbie motors in sizes
from 3 to 75 H. P., one to six
cylinders.

Power

In these two vital characteristics of engine operation—Dependability and Power—Frisbie Valve-in-Head Motors are supreme. Two of the most abused words in the engine builder's vocabulary, still they tell the Frisbie story more clearly than any other two words in the language.

After all there is not much else of real importance about an engine. After you have cruised with a Frisbie you will realize that little else counts.

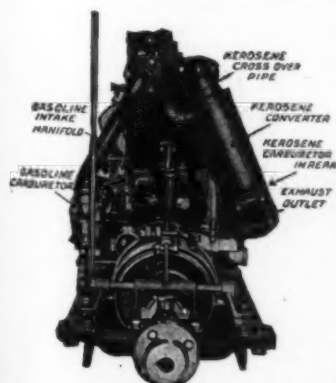
Stop and think a moment before you decide on what you want in the next engine you buy. You want ample power to drive your boat—the economical power procured by efficient design rather than the wasteful power developed by big bore and stroke.

And you want dependability—the quality that drives your boat hour after hour, day after day, without worry or attention. If your motor is a Frisbie you'll have such dependability in the highest degree.

Frisbie Valve-in-Head design gives approximately 20% greater power than ordinary motors of the same size. For that reason the Frisbie does its work with lower fuel consumption and less strain than the average motor.

You can't judge the Frisbie by any motor standard you have known in the past. You have to get intimately acquainted with it, to see it in operation and put it to severe test before its peculiar dependability strikes you.

All Frisbie models are medium speed four cycle engines. Finest of materials and workmanship throughout. Equipped for either gasoline or kerosene.



Write today for latest catalog.

The Frisbie Motor Company

7 College Street

Middletown, Conn.

The illustration at the left shows an end view of the three cylinder, 18-25 H. P. Frisbie, equipped for kerosene, with separate manifolds and carburetors on opposite sides. The Frisbie Kerosene equipment is a thorough success. We have operated the machinery of our plant on one of our kerosene motors for several years.



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SERVICE

A Word to Marine Dealers



The management of MoToR BoatinG is undertaking a campaign of cooperation with marine supply dealers and engine agents for the benefit of the dealer, the manufacturer and the industry in general. We believe that our common interest will be served by a better understanding of each other's problems and that with this understanding will come more business and greater profits for every member of the trade.

The future of the marine trade is brighter today than ever before. The feats of motor boats in the world war are advertising the practicability of power craft for all pleasure and commercial purposes, while thousands of enthusiastic converts are being added to the rolls of future boat owners.

Selling More Marine Supplies

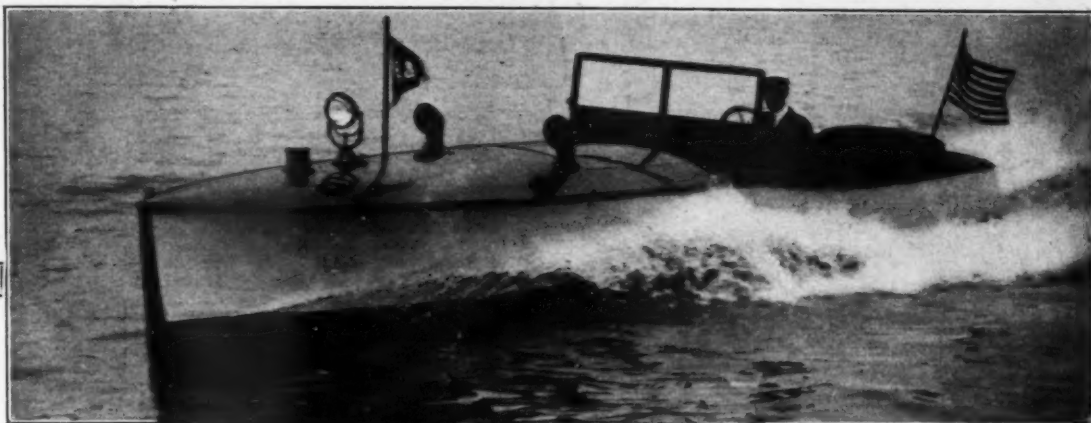
It is only reasonable that the dealer who carries a complete stock of well selected marine supplies will sell a greater annual volume than the dealer who has only a small assortment and cannot fill every order promptly. For the same reason the dealer who is best informed on boats, engines, marine accessories and boating developments will do the best business in his locality.

We believe that both pleasure and commercial boating are only in their infancy. In spite of tremendous strides in the past few years, the business to come is greater than the present facilities of the industry could take care of. The final link of the chain of distribution—the retail outlets of the trade—should be made ready for these increased demands.

MoToR BoatinG's plan is based on the premise that a compact, well organized trade will be more efficient in developing boating interest and broadening the marine field than a loosely knit organization, lacking cooperation and common interest. The plan is too comprehensive to be explained in full here. We request the privilege of taking it up in more detail with any dealer who is interested in the possibility of bigger business and greater profits.

Write us on your letterhead, telling the line or lines of marine products you handle

MoToR BoatinG, 119 W. 40th St., New York City



Fay & Bowen 32 x 5'6" Concave V-Bottom Runabout, from designs by Crouch. Speed 22 miles per hour with six cylinder 5 x 6 1/4" Fay & Bowen engine.

Thirty-two Feet of Solid Comfort—

The boat shown above is a concrete expression of all we believe a fine runabout should be. And as we have been building motor boats for many years we are in a position to know something about the subject. Examine it at the Motor Boat Show and you will agree with us.

The planking is Southern white cedar, all copper and brass fastened—the top work and interior mahogany finished, and the deck laid in narrow strips, with all fastenings and bright work plugged. The upholstery is rich and deep. Full set of electric running lights, electric gauge and cockpit lights, electric horn, fire extinguisher and windshield regular equipment. Usually fitted with Golde patent one-man auto style extension top.

The following letter tells what one owner thinks of this boat:

Wilkes-Barre, Pa., Jan. 2, 1918.

"It gives me pleasure to write you just a word about the splendid Crouch Design 32' Runabout with Six Cylinder 75 Horse Power Fay & Bowen Engine, which I had the use of during the past season. This boat has responded each time to every demand. It is so simple of operation that my daughter has been driving it with perfect satisfaction. It is the most graceful and one of the snappiest Yachts that I have ever seen, and from my past experience with Fay & Bowen boats, I feel sure that it will give us many years of splendid service.

Yours truly,

(Signed) F. J. WECKESSER.

We also build several other popular models of Fay & Bowen runabouts, mostly smaller, and lower in cost. Let us know the type of boat you want and we will send details and prices.

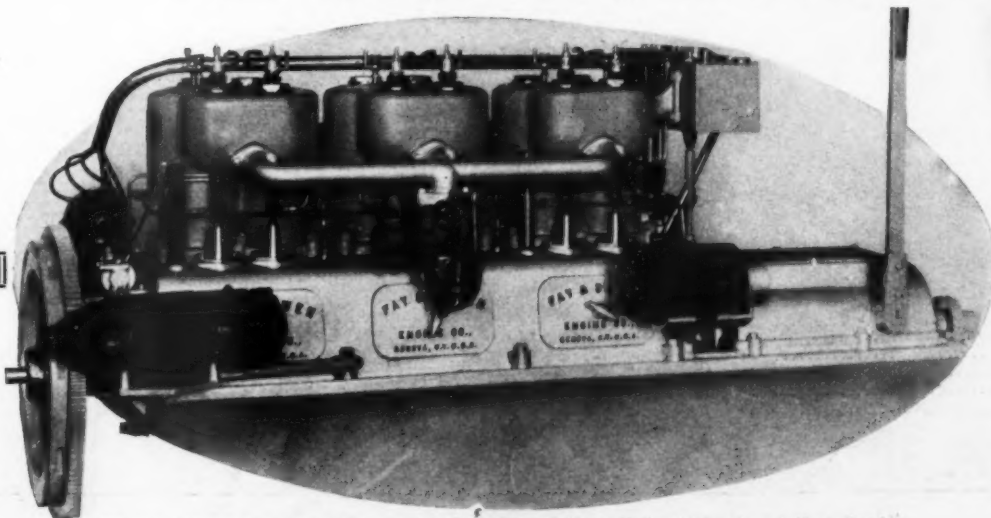


Four Cycle Engines
Two Cycle Engines
Finished Motor Boats
Electric Lighting Units
and Pumping Sets
Write for Catalogs.

FAY & BOWEN ENGINE COMPANY

104 LAKE STREET, GENEVA, N. Y., U. S. A.

New York: 50 Church Street, on Concourse, Sutter Bros., Representatives
Built for Canada by ST. LAWRENCE ENGINE CO., LTD., BROCKVILLE, ONT.

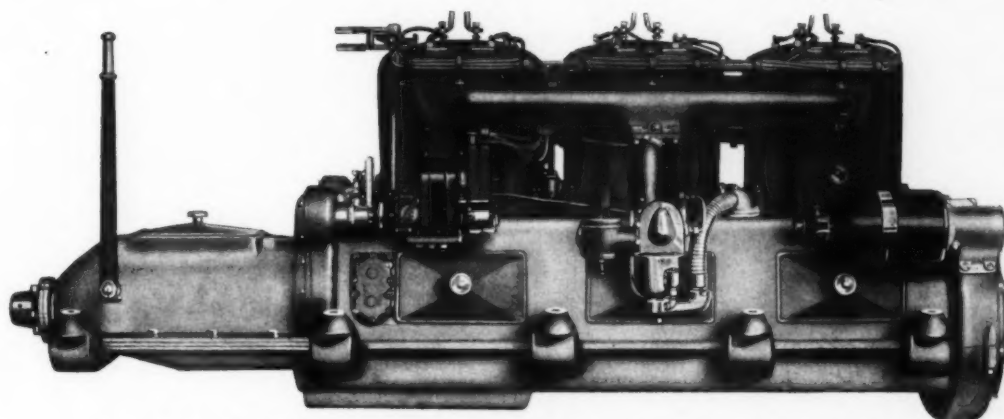


This is the reliable Fay & Bowen engine which drives the boat shown above. Six cylinders, 5 x 6 1/4" with two-point ignition and complete electric starting and lighting equipment.

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Sterling

THE ENGINE OF REFINEMENT
For the
finest boats that float



Inlet side Model FS, 6 cylinder, 130-145 H.P. Sterling motor of the counterbalanced crankshaft type, bore 5½", stroke 6¾".

THE STERLING ENGINE COMPANY
is the pioneer in the marine field
incorporating the

COUNTERBALANCED CRANKSHAFT

THE MODEL F LINE—
—with 3 years of development—
has been brought to a stage of perfection
IN THE 1918 MOTORS.

LARGE QUANTITIES IN THE
SERVICE OF THE UNITED
STATES GOVERNMENT, ENG-
LAND, ITALY and RUSSIA.

IT'S A REAL MARINE MOTOR FOR
MARINE SERVICE.

CONSULT WITH US AS TO YOUR
REQUIREMENTS.

STERLING ENGINE COMPANY

1254 Niagara Street

Buffalo, New York

KERMATH

Dealers and Boat Builders!

THIS IS YOUR MOTOR

Because

It is profitable to handle.
 Because our factory gives you proper co-operation.
 Recognizes you as its medium of distribution and sale.
 Protects you as you need protection.
 By maintaining list prices to consumers and—
 Rewards your efforts by giving you a fair profit.
 Recommend Kermaths at every opportunity, get your profit to which you are entitled.
 Build your business on the profit which is the main prop to your stability.
 Better yourself by sticking with the factory that sticks with you.
 Be Salesmen, know what's best for your customer and make him know it.
 Give Service, to maintain your trade; it's the back-bone of your business.
 If you haven't a Kermath agency—Get it.
 We want good agents.
 Know our proposition.
 We are for you always.
 Carry one motor or more in stock for immediate delivery.
 Be alive to your opportunity, deliveries get the business and profit.
 You can afford to stock a motor with the Kermath factory back of you.
 The Kermath is worth handling. It's the protection that counts.

The Model that made 12 H.P. famous.
 10-12 H.P.
 \$295 and up.

YOUR CUSTOMER'S MOTOR

Because

It's modern, up to date, 4 cycle 4 cylinder, simple.
 Highly refined to a degree not found in other motors.
 There's a reason—
 We have spent 7 years building this one type in 3 sizes.
 We haven't shot our efforts in 40 directions.
 We haven't changed our models every new moon.
 Because they were right at the beginning.
 But they have been refined, made better—better and better.
 Kermath motors have steadily advanced, led at the start and maintained their lead.
 Today's Kermath Motor is the result of development, not haphazard changes.
 We build as many motors of this type as any other three factories combined.
 Why couldn't we build a better motor.
 We are alive, we know our duty to you and we fulfill it.
 By making a motor that's right all the way through—
 Pay your boatbuilder his profit—It will pay you.
 He is a good-fellow and will give you good service in return.
 Don't buy from the builder who throws-in something for a bait.
 He can't throw-in and stay-in.
 You can't do it in your own business.
 Pick your dealer and get a safe one.

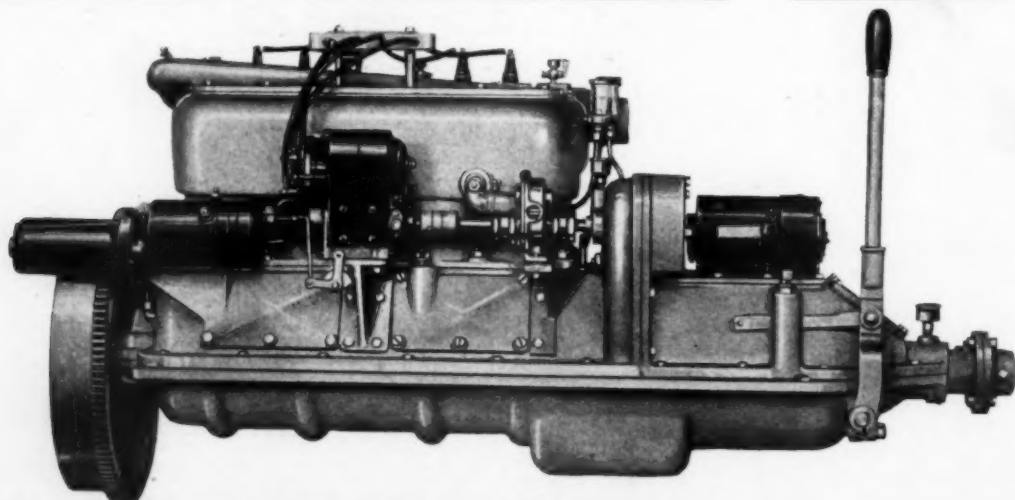
A good size and a winner.
 16-18 H.P.
 \$320 and up.

THE WORLD'S MOTOR

Because

It Hooverizes on fuel to an extent of being stingy—
 Makes the work-boat economical to operate.
 Makes pleasure boating less expensive.
 Helps to conserve the nation's resources.
 It is driving life-boats, dispatch boats, ship tenders, hospital boats.
 It's fighting battles by driving field dynamos for powerful searchlights, driving air compressors and water pumps.
 In far off Australia, New Zealand, Siam, Straits Settlements, China, India, Africa, South America and in practically every country, Kermath Motors are known.
 They are known most favorably too for their splendid qualities of—
 Perfect control, silky operation, quiet running, and the oil stays inside.
 Run, they will simply everlastingly run.
 They seem to breathe energy and deliver a fine power.
 They are a masterpiece of gas engineering.
 Truly distinctive motor in a class by themselves.
 The best dealers in the world handle them—
 But there is some good territory still open.

A fine cruiser motor.
 20-25 H.P.
 \$370 and up.



KERMATH MANUFACTURING COMPANY, Dept. 2, Detroit, Mich.

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